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NOTICES.—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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An Appeal to the Nation

AT last it has been decided to appeal to the nation for a mandate for a National Government. Nomination day will be Friday, October 16, and polling will take place on Tuesday, October 27. The decision has been well received in the City and in business circles everywhere. At this crisis one duty falls on every loyal citizen. It is to demonstrate to the world the unity of the British people and their determination to put the welfare of the nation as a whole before any class or sectional interests. This will immediately increase public confidence and lay the basis for steady recovery.

Protection to Indian Chemical Industry

THE Government of India have announced, on the recommendation of the Indian Tariff Board, their intention to place before the Assembly a Bill providing for the protection of the heavy chemical industry. The case for protection is discussed by the Tariff Board in the course of their report of the inquiry which they held over two years back. This report is dated 1929, but was not released for publication until September 5, 1931. Sulphuric acid is considered to be the basis of the whole group of chemicals covered by this Report. On account of the heavy freight on acids the manufacture of sulphuric, hydrochloric and nitric acids has generally been carried on profitably in India. The absence of this national protection in the case of salts derived from sulphuric acid has, however, prevented this manufacture except on a small scale. The total market in India (excluding Burma) for the chemicals concerned is approximately 12,000 tons in terms of chamber acid on a 100 per cent. basis. In the next few years the market may reach 16,000 tons, without taking into account the manufacture of artificial fertilisers. The Board have therefore come to the conclusion that the market in India is now sufficiently large for the production of chemicals on an economic scale.

In the course of this Report it is stated that "the case for protection of the chemical industry rests primarily on its supreme national importance. It is a key industry whose products are used in most other industries, it is indispensable for purposes of national defence, and it provides an essential foundation for chemical research in industries and agriculture." The proposed new protective duties, under the Bill, would have effect until March 31, 1933, pending further consideration of the possibility of reorganising the industry on an economic basis. No assistance is called for under present circumstances in respect of ammonium sulphate. The manufacture of superphosphate, however, has been considered a suitable industry for the grant of protection, which, in this case, should take the form of a bounty "payable on the first 10,000 tons of superphosphate produced in a year by any individual factory whose annual output is not less than 2,000 tons." In spite of competition from compound fertilisers the Tariff Board is of the opinion that there will be a sufficiently large market in India for superphosphate and that the establishment of a local industry will help materially to reduce its price to the great benefit of the Indian agriculturist.

Intellect on a Glass Dish!

WE have seen many sights in the Albert Hall—concerts, balls, political meetings, boxing matches, religious revivals—but none of them has equalled the Faraday Centenary Exhibition, as a testimony to the achievements of man and to the marvels of science, pure and applied, in a variety of fields, all arising out of the discoveries of one man in the laboratories of the Royal Institution.

Among the myriad exhibits there was one occupying no more space than does the human hand, consisting of three glass dishes containing specimens of insulin, adrenaline and thyroxine, two of them substances which, since they contain the benzene nucleus in their molecule, might be said to have arisen out of Faraday's original discovery of this subject. Probably all the visitors passed them by, little realising that they were beholding one of the latest achievements of the chemist, namely, his isolation and synthesis of those substances which control the very functions of the body. The old

physiology was based on nervous regulation of our bodies; the new physiology, which assimilates and is incorporated with it, postulates chemical regulation by which is understood that the functions of bodily organs, including the nerves, are influenced by chemical substances circulating in the blood. Thus adrenaline increases the blood pressure and so controls the heart; thyroxine determines whether we be intellectuals or idiots. Both have had their constitutions determined and have been synthesised. Insulin controls our sugar metabolism; some day soon we shall know all about it and synthesise it also.

The exhibit was appropriately labelled, but something much more sensational is needed to bring the achievement home to the public. Science has established the remarkable fact that the highest functions of the brain cannot be carried out in the absence from the blood of a relatively simple substance that we can make in the laboratory. Intellect on a glass dish!

American Interest in Our Position

A MESSAGE just received by THE CHEMICAL AGE from a prominent personality in the chemical industry of the United States expresses, we believe, the general feeling of concern and friendliness throughout America. "We are all," he writes, "watching very closely the developments in your country. While we realise that the times are trying, we have no doubt that all will come out well. We certainly hope so." American visitors over here take much the same view; some, in fact, seem more concerned about the situation likely to arise during the coming winter in their own country. It is generally felt that in view of the world depression the situation can only be adequately dealt with on an international basis, and the prospective negotiations between France and England, and France and the United States, are welcomed as practical steps towards an understanding. A high American banking authority who has been in England is reported to be leaving in a much more hopeful state of mind than when he arrived. He has been impressed by the steadiness of British opinion and by the general cheerfulness that prevails, which supplies a marked contrast to the grimness and anxiety felt in the United States. It is a good sign that the leading nations are coming to realise that they have to deal with problems common to them all.

Currency Exchanges

THE difficulties referred to in our last issue arising from the refusal of foreign exporters to accept payment in sterling still continue, and they apply, not merely to chemical importers, but to all classes. It is, of course, obvious that if importers in this country who have ordered foreign goods to be paid for in sterling and who may have entered into delivery contracts with customers in this country, have to pay in marks or francs they will be involved in loss on the transaction. The difficulty is so widespread that chambers of commerce throughout the country are giving it special attention, and the Department of Overseas Trade is fully aware of the position.

Ultimately, we suppose, in the event of a persistent dispute, the matter would have to be settled by the courts, but in view of the large number of cases, every effort would no doubt be made on both sides to come to an understanding, and this could best be done through the recognised chambers of trade. It is suggested, therefore, that where any importer feels himself to be unjustly treated owing to the variation in the exchanges his proper course is to lay the facts before his own chamber, so that all cases can be collected and proper representations made through a central authority. In the meantime it is advised that no settlements, other than in sterling, be made.

New Nitrate Price

COSACH, the Chilean national nitrate combine, announces that the new price of nitrate, to run to June 30 of next year, will be 36 dollars per ton of 2,000 lb. as compared with 41 dollars last year. The uncertainty and the exchanges at present make it difficult to follow what the selling price in the United Kingdom, based on these terms, would be, and also what conditions of shipment the quotation indicates. A reduction was, of course, to be expected, but until actual quotations in sterling for home sales are announced it is impossible to say how the new price compares with that of sulphate.

Books Received

THE OXIDATION OF HYDROGEN, CARBON MONOXIDE AND THE PARAFFIN HYDROCARBONS BY COPPER OXIDE. Fuel Research Technical Paper No. 33. London: H.M. Stationery Office, Pp. 28. 9d.

THE ROYAL TECHNICAL COLLEGE, GLASGOW. Calendar, 1931-32. Pp. 448.

The Calendar

October 7	Society of Public Analysts: Papers by J. C. Maby, T. Callon, W. L. Davies. 8 p.m.	Burlington House, London.
12	Institution of the Rubber Industry. Eighth Annual Meeting. "The Advantages and Disadvantages of Technical Training for Salesmen in the Rubber Industry." A. E. Osborn. 7.30 p.m.	First Avenue Hotel, London.
12	Ceramic Society: Pottery Section: "A Study of Shovelling." G. Townsend Harley. 7.30 p.m.	North Staffordshire Technical College, Stoke-on-Trent.
12	Institute of Metals (Scottish Section): "Some Random Reflections on Industrial Problems and Economics." L. Short. 7.30 p.m.	39 Elmbank Crescent, Glasgow.
13	Institution of Petroleum Technologists: "Sweating of Paraffin Wax." H. L. Allen. 5.30 p.m.	John Street, Adelphi, London.
13	Institute of Metals (N.E. Coast Section): Chairman's Address. J. W. Craggs. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
13	Institute of Metals (Swansea Section): Chairman's Address. A. M. Kempson. 6.15 p.m.	Y.M.C.A., Swansea.
15	Chemical Society. 8 p.m.	Burlington House, London.
15	Optical Society. 7.30 p.m.	Imperial College of Science, London.
16	Society of Dyers and Colourists (Manchester Section): "The Chemical Development of Modern Textile Finishing Products." Dr. A. F. Kertess. 7 p.m.	36 George Street, Manchester.

The late Professor Hinchley

Memorial Service in London

THERE was a large attendance on Saturday morning at the memorial service for Professor J. W. Hinchley held at the Ethical Church, Bayswater. The service was conducted by Mr. J. Hutton Hynd, and addresses in appreciation of the late professor's work and character were delivered by Mr. H. T. Tizard, Rector of the Imperial College of Science, and Mr. W. A. S. Calder, president of the Institution of Chemical Engineers.

Mr. Calder's Tribute

Mr. Calder, who as President of the Institution of Chemical Engineers, of which the late Professor Hinchley was hon. secretary, was closely associated with him, offered a most kindly and discerning appreciation in the following terms:—

"Wisdom is the principal thing, therefore get wisdom and with all thy getting get understanding. Though I understand all mysteries and all knowledge and have not charity I am nothing."

The great and good man whose memory we keep green comprehended fully both these fundamental truths, truths which the passing of the centuries leaves as unaltered as human nature itself. John William Hinchley, combining as he did great gifts of mind, together with a deeply sympathetic understanding of his fellow men, was a practical idealist. It is to idealists that the world owes its visions, and to practical idealists its progress. Realising the need for the practical development and application of scientific knowledge, he had the vision to see that among the multifarious existing societies of all kinds there was a definite gap which needed to be filled. This gap has been filled by the Institution of Chemical Engineers for which he worked and fought so devotedly, and which had a place in his affections only equalled by that which he himself inspired among its members.

You need no details of his multifarious activities in this connection, the Institution itself standing as a memorial to his vision and enterprise. His conception of the Institution was no mean one. He had visions of a round table of scientific knights devoted to the development of true knowledge, whose service should ever be at the disposal of distressed industry, shackled as he viewed it with the rusty fetters of custom and ignorance. Himself, Sir Bors, "a square set man, and honest, and his eyes the outdoor sign of all the warmth within," he endeavoured to infuse those around him with his own enthusiasm and ideals. Ever on the side of the angels there is many a man who is the better for having known John William Hinchley.

Matthew Arnold's words are for our comfort—

"Oh, strong soul by what shore tarriest thou now?
For that force surely has not been left vain,
Somewhere surely afar, in the sounding labour house vast of being, is practiced that strength, zealous, beneficient, firm."

A Representative Company

Among those present were: Mrs. Hinchley, Miss Hinchley, Sir Frederick Nathan (Past President of the Institution of Chemical Engineers), Lady Nathan, Mr. G. Gray, Dr. W. H. Hatfield, Mr. H. W. Cremer (hon. secretary, Institution of Chemical Engineers), Mr. W. A. S. Calder (President, Institution of Chemical Engineers), Mr. C. S. Garland, Professor W. E. Gibbs, Mr. W. Macnab, Mr. P. Parrish, Mr. H. I. Pooley, Mr. J. Arthur Reavell, Mr. F. H. Rogers, Dr. F. S. Sinnatt, Mr. H. Talbot, Mr. S. G. M. Ure, Dr. H. J. T. Ellingham, Mr. E. A. Reavell, Mr. R. F. Stewart, Mr. C. J. T. Mackie, Mr. Keith Fraser, Mr. and Mrs. L. W. Blundell, Sir Herbert Wright (Chairman, Executive Committee of the Governors of the Imperial College of Science), Mr. and Mrs. H. T. Tizard, Professor W. A. Bone, Professor and Mrs. Brame, Lieutenant John Brame, Mr. A. G. Craig, Mr. Hattiangadi, Mr. W. H. Merrett, Miss Lawson, Miss Dartmall, Mrs. Murray Ross, Miss Hayward, Mrs. W. Thomson, Miss Eleanor and Miss Emily Gilbert, Mr. C. Rowe, Mr. W. A. Norton, Mrs. Morse, Miss Henniker, Mrs. Murphy, Mr. and Mrs. R. H. Brown, Mr. G. Spinner, Mr. F. J. Gould, Mr. J. F. Chambers, Miss M. L. Pendred, Mr. and Mrs. Christopher Williams, Miss Taylor, Mrs. Walder, Mr. W. D. Graddon, Mr. K. L. Emler, Mr. F. J. Bailey, Mr. C. H. Field, Mr. C. R. Scott Harley, Mr. and Mrs. Omar Ramsden, Mrs. Shorter, Mrs. Mount, the Rev. A. Seymour, Mr. A. C. V. Sweeting, Mrs. Elmore, Miss Owen, Mr. E. A. Alliott, Mr. E. Udale, Mr. D. Newitt, Mr. H. Smith, Mrs. Mills, Miss Vavasour-Earle, Mrs. Walters, Dr. Martha Whitely, Mr. and Mrs. Gow, Mr. W. C. Hancock, Mr. C. Watson, Mr. and Mrs. Gibson Clark, Mr. J. MacGregor, Mrs. W. S. Young, Mr. J. C. Mullin, Professor and Mrs. MacBride, Mrs. Shore, Mrs. Udale, Miss Udale, Mr. and Mrs. Himus, Dr. Hawkins, Mr. Stanley Robson, Miss Drew, the Misses Newton, Mr. Frank Lord, Mr. and Mrs. Heron Rogers, Mr. and Mrs. T. H. Hill, Miss V. Kimber, Professor C. G. Cullis, Dr. L. A. Jordon, Mrs. J. M. Tate, Mr. C. T. Tate, Mr. P. Roebuck, Professor and Mrs. Philip, Professor and Mrs. Thorpe, Dr. R. E. Hampson (representing the British Launderers' Research Association), Mr. and Mrs. James MacGregor, Miss Hughes, Miss Russell, Mr. and Mrs. Lowry, Professor P. Phillips Bedson, Mrs. Langham, Mr. Noel Heaton (President, Oil and Colour Chemists' Association), Mr. Woodcock (Treasurer), and Mr. H. M. Morgan (Chairman) (representing the British Association of Chemists, London Section), Dr. E. H. Tripp, Mr. and Mrs. Gun, Mr. W. Randall and Mr. C. B. Woodley.

The service was impressive. After Chopin's Funeral March had been played by Mr. C. Kennedy Scott, the Introductory Sentences were read by Mr. Hutton Hynd and these were followed by a canticle by the choir. Prior to flowers being laid at the foot of the altar by Mr. Sainsbury (representing the Ethical Church) and Miss Creighton (for the Friday Club) the choir sang the anthem "The Souls of the Righteous." Mr. R. O. Prowse (representing the Church and the Club) then gave an epitome of Professor Hinchley's labours in these directions. All present then joined in singing the hymn "O Grave Where is thy Victory," and after the Valediction by Mr. Hutton Hynd the service terminated with the "Amen" from the choir.

Economics of Steam Production and Utilisation

A NEW monthly technical journal dealing with the vast field of steam power and steam heating has made its appearance with the title of *The Steam Engineer*. It is under the editorial direction of Mr. John D. Troup, M.I.Mech.E., M.I.Chem.E., F.Inst.Fuel, and is published at 34-35 High Holborn, W.C.1. Its purpose is to collect together in one journal all economic factors governing steam engineering. At present the industries in this country are using over 80 million tons of coal per annum for steam generation, but they are not all equipped to generate and utilise this steam at the lowest cost to the manufacturer. No two steam problems are alike; each installation must be studied from the manufacturing process viewpoint, whilst the whole of the heat consuming apparatus must be studied for consumption, temperature and load factor, in order to arrive at an economic balance. As a practical journal *The Steam Engineer* is therefore welcomed. The contents of the first number (October) includes an editorial on coal, by Professor H. E. Armstrong, with articles on the future of steam engineering in Great Britain (David Brownlie), thermal storage (E. G. Ritchie), back pressure and extraction steam plants (C. S. Darling), erosion of induced draught fans, fuel saving by the use of steam accumulators, a modern Lancashire boiler plant and other matters.

Life of the late Lord Melchett

MR. HECTOR BOLITHO, who has just completed a life of the Prince Consort, has been commissioned to prepare a biography of the late Lord Melchett. He is already at work gathering material for the opening chapters, which will deal with the background of Dr. Ludwig Mond and his wife. Letters, anecdotes, etc., may be sent to him at Melberry House, Smith Square, London, S.W.1.

A Wider Use for the Slagging Producer

Gas Generators as Direct Producers of Metallurgical Products

The following extracts are from a paper by N. E. Rambush and F. F. Rixon, read at a meeting of the Institution of Chemical Engineers, on Friday, October 2. They show that by employing a hot blast, the slagging producer, while still functioning primarily as a gas producer, acts as a direct producer of metallurgical products—ferrous and non-ferrous—by virtue of the smelting which takes place at the hearth. In such a producer, ferruginous shale of a high ash-content can be treated to yield gas, silicious iron and a slag suitable for making into cement. Low grade fine coal and ferruginous residues, when formed into briquettes, can also be treated to yield the same products.

In the early slagging producers a cold blast was employed and no steam was added. Coke, coal and lignite were, in various cases, gasified. A small quantity of pig iron was tapped with the slag, due to iron in the ash of the fuel. The main operating difficulty was to keep the slag in a suitable liquid condition. Limestone was first tried as flux, but was found unsuitable owing to lumps not fusing into the slag, and this led to the adoption of blast furnace slag as flux. Preheating the air blast to above 250° C. and the introduction of steam through separate tuyeres were features of the Würth producer, two of which were erected at a works at Bochum in 1913. In previous experimental work no steam was added, but owing to too high a temperature at the tuyeres preliminary formation of clinker occurred above the slag. To absorb the excess heat, steam was introduced and the producer worked fairly smoothly. The slagging producer was also developed, independently, at Georgs-Marienhütte, in Germany, experiments having been carried out as far back as 1905. Here the first producer built had a throughput of 30 tons coke per 24 hours. The blast was preheated to only 55° C. and no steam was added; basic open-hearth slag was used as flux. About 32 kg. of pig iron was produced per ton of coke, having the following analysis:—Mn (9.27%), P (9.25%), S (0.02%), and the average composition of the gas was CO_2 (0.6%), CO (33.4%), H_2 (0.9%), CH_4 (0.5%), N_2 (64.6%).

The "L'Air Chaud" Producer

In 1920 an experimental slagging producer utilising an air blast preheated to between 400-600° C. by means of special tubular preheaters, was put to work at St. Etienne, France. The charge consisted mainly of shale containing a high percentage, up to 70%, of ash. This producer worked satisfactorily, yielding a good and uniform gas of nett calorific value of 120-140 B.T.U. per cu. ft. at N.T.P., a slag suitable for making into cement, and a silicious pig iron. Limestone was added as flux and found satisfactory. A patent was granted to H. J. F. Philipon and A. Dessemond, in which a claim was made for the use of a highly preheated air blast for gasifying low-grade fuels of a high ash content with the simultaneous production of a slag suitable for making into cement and pig iron. Special stress was laid on the ease and flexibility of operation, and the fact that by adjusting the temperature of the air blast, charges of widely varying composition can be gasified without breaking the continuity of operation. This is the first time on record that the air blast supplied to a gas producer has been preheated up to 600° C., and the first time that fuels containing up to 70% ash had been successfully gasified.

In 1924 the company "L'Air Chaud" was formed to exploit this type of slagging producer, and in 1925 two producers, each capable of handling a total charge of about 120 tons per 24 hours, were erected at St. Etienne to gasify a mixture of shale and inferior coke and produce by-product slag, which was converted into cement and silicious pig iron. The shale contained about 65% ash, 14% volatile matter, and 21% fixed carbon; the coke, 28% ash and 70% fixed carbon. The total fixed carbon content of the charge was about 25%; the air blast was preheated to 600° C.; and 1,700 kg. slag and 950 kg. silicious pig iron containing 6-8% silicon were produced per 1,000 kg. of fixed carbon. Working alternately, these producers have been in continuous operation for six years. The gas is sold to a neighbouring glassworks and the silicious iron and cement made from the slag find a ready market.

Since the slagging producer has a much shorter shaft than the ordinary blast furnace and the iron included in the charge is present either in the ash of the fuel or closely incorporated with the fuel, practically no indirect reduction of iron takes place in the shaft. This is proved by the low CO_2 content of the exit gas.

Application to Non-Ferrous Metallurgy

In non-ferrous metallurgy the shaft furnace is employed for the smelting of lead, tin and copper. Lead and tin are tapped from the furnace in the metallic state, and copper as a matte consisting of iron and cuprous sulphides. The ore, before being charged to the furnace, is concentrated by mechanical or other means and then undergoes a preliminary roasting treatment to free it from undesirable impurities. Metallurgical coke is employed as fuel and the quantity added is the minimum which will satisfy the heat requirement of smelting. Reduction takes place partly by means of solid carbon in the intense zone and partly by means of generated carbon monoxide in the shaft of the furnace. An appreciable quantity of carbon monoxide still remains in the gas leaving the furnace, but the percentage present is such that the gas is too poor to be utilised so is usually run to waste.

A cold blast is purposely employed because the required temperature of the fusion zone is lower than in the smelting of iron and because an increase in the amount available heat at the hearth results in a portion of the metals being volatilised. Even in ordinary practice with a cold blast some lead and tin are volatilised, the volatilised portion being partly converted to oxides. The bulk of the volatilised metals is condensed higher up in the furnace but some escape with the furnace gas. If the ore contains zinc, practically the whole of the zinc is volatilised as zinc oxide. Some of this is deposited on the walls near the top of the furnace, causing blockage after a time. The shaft of the furnace can be considered to act as a reflux condenser, volatilised metals being continually condensed and returned to the intense zone.

Utilisation of Metallurgical Refuse

With low-grade ores and metallurgical refuse which are unsuitable for direct extraction in the shaft furnace, the possibility of volatilising the major portion of the valuable metals present is worth considering. When the hot blast slagging producer is charged with low-grade ore or metallurgical refuse, together with fuel and limestone, and fed with a blast preheated to the requisite temperature, metals such as zinc, cadmium, lead and tin are volatilised. The carbon included in the charge is converted into a combustible gas, the calorific value of which will depend on the quantity and quality of the fuel. The volatilised metals pass over with this gas and, on cleaning the gas, can be recovered as a "concentrate" consisting chiefly of oxides. The clean gas can be utilised for firing boilers, etc. If the ore contains copper and sulphur a fusible matte will be formed consisting of cuprous sulphide mixed with iron sulphide and possibly metallic iron. Any precious metals which may be present will be included in this matte. When the ore contains a considerable proportion of iron oxide and if sufficient fuel be included in the charge, a pig iron is formed containing elements such as silicon, manganese, copper, phosphorus. The slag, matte or pig iron can be tapped from the producer periodically and the matte or pig iron may prove to be valuable by-products in addition to the volatilised oxides and gas. In certain cases the slag when free from iron and not containing a high percentage of sulphur, may be suitable for making into cement.

The fuel which is included in the charge may be of an inferior grade and may contain volatile matter for boosting up the calorific value of the gas which is produced. In practice, it has been found best to incorporate the ore and fuel in the form of briquettes. For this purpose, low-priced fuels, such as coke breeze, coal and anthracite "fines" can be employed. The charge to the producer then consists

mainly of these briquettes, together with a little limestone and coke.

Trials which have been carried out on an experimental producer show that practically any kind of ore and metallurgical refuse can be treated. In all cases, the metals zinc, cadmium, lead and tin are volatilised and can be recovered on cleaning the gas; in some cases, other metals such as manganese and silver are also volatilised, and either a matte or pig iron is produced, according to the nature of the charge and working conditions. The calorific value of the gas which is produced varies from 90 to 140 B.T.U. per cu. ft., according to the amount and nature of the fuel included in the charge. Successful operation of the producer is governed by an appropriate relationship between the fixed carbon and metallic contents of the charge and a suitable blast temperature.

Volatilising Producer at Zinc Works

A volatilising producer having a capacity of 120 tons per 24 hours has been in operation since 1927 at a zinc works in France, treating a mixture of zinc residue from an electrolytic process, coke and limestone. The producer was installed by the company styled "Fusion et Volatilisation," an associate of the "L'Air Chaud." Recently this producer has been replaced by a similar and larger one, capable of treating 200 tons per 24 hours. The present producer is rectangular in shape, 11 ft. 6 in. long by 5 ft. 6 in. wide and 23 ft. from the base to the throat. It is water cooled on the outside and provided with a number of water-cooled tuyeres with a tapping hole at one end.

The residue, which is obtained from the electrolytic process and is insoluble in sulphuric acid, consists chiefly of zinc ferrite, $ZnO.Fe_2O_3$, and contains some 20% Zn and 7% Pb. It comes from rotary filters as a slurry, which is mixed with coke breeze, and after partial drying formed into briquettes containing about 16% of fixed carbon. The briquettes mixed with lump coke and limestone to give a total fixed carbon content of about 26%, are charged at intervals to the producer. The clean gas contains approximately 10% CO_2, 24% CO, and has a nett calorific value of 90 B.T.U. per cu. ft. Part of this gas is utilised in the preheaters in a calcining kiln and for drying the briquettes. The remainder is used for boiler firing.

The volatilised metals, present chiefly as oxides and partly as sulphides, are recovered as a sludge from the wet scrubbers and Theisen washer. This sludge passes to a Dorr thickener and then to a rotary filter. The residue from the filter then passes to a rotary calciner, heated by gas from the producer, in which it is dried and calcined. The final product "concentrate," consists chiefly of zinc and lead oxides, together with some sulphides. It gives an analysis, Zn (50-60%), Pb (12-22%), S (5-8%), but composition varies according to the nature of the residue. This concentrate is treated with dilute sulphuric acid from the electrolytic process, whereby zinc sulphate (soluble) and lead sulphate (insoluble) are formed, and separated by filtration, the zinc sulphate being returned to the electrolytic process, and the lead sulphate sold as a by-product.

Operating Results

The producer is tapped about every 30 minutes, and the slag and matte are run together into ladles. When the tapping is completed the slag is run down a shute swept with water into a pond, thereby becoming granulated. The slag of a dark colour containing an appreciable quantity of iron is removed from the pond and carried to waste. The matte, in the ladles, is allowed to solidify and cool before being tipped out and broken up. Owing to the silver which it contains it is sold to refiners, a typical analysis being as follows:—Fe (55-60%), Cu (3-5%), S (25-27%), Zn 1%), Ag (2 Kg. per ton). The producer is run continuously for about a fortnight and then shut down for 24 hours for cleaning purposes. The products obtained per 24 hours are:—Total gas, 190,000-220,000 cu. m. at N.T.P.; slag, 35-40 ton; matte, 15-18 ton; concentrate, 20-22 ton. The matte can be treated to raise its copper content and to yield some 30 Kg. (66 lb.) of silver. The concentrate will yield 10-12 tons of zinc and 4-6 tons of $PbSO_4$. About 80,000 cu. m. of the gas are taken up by the preheaters, calciner and briquette drier, leaving some 120,000 cu. m. of gas available for boiler firing.

By-Product Pig Iron and Slag

The production of gas, in conjunction with a by-product pig iron and slag, by such producers offers a promising field for the utilisation of low grade and waste fuels of a ferruginous nature. Many collieries possess a potential supply of suitable low grade fuels, which are usually separated from good grade coal by hand picking and washing and sent to waste heaps owing to a lack of demand. Consequently, other conditions being favourable, the gasification of these fuels at the colliery itself appears promising. The gas can be used for firing boilers at the colliery, thus releasing coal of a commercial grade for the market, or it can be delivered to a neighbouring works for firing furnaces and generating power. The silicious iron, which commands a higher price than ordinary pig iron, should be readily disposed of, especially if the colliery is owned by an iron-producing company. The slag is very easily converted into a good cement, which can be sold at a low price and should on this account find a ready market with local builders, etc.

A common waste material at many collieries is shale containing a high percentage of ash and a low percentage of volatile matter. Frequently the shale is of a ferruginous nature, the ash containing an appreciable quantity of iron. If coke and limestone are also available at reasonable prices, such shale can be economically gasified with simultaneous production of slag and silicious iron. Shale containing 40-60% ash and 15-20% volatile matter, with upwards of 15% iron in the ash, is admirable for treating in this way. Another low grade fuel containing a high percentage of ash but a higher percentage of volatile matter and total carbon than shale is cannel coal. The ash, again, frequently contains a high percentage of iron. It may be possible to treat a mixture of such fuel and limestone to yield an enriched producer gas—due to the volatile matter present, silicious iron and slag. Alternately, the cannel coal may be subjected to a low temperature distillation for recovery of oils in the volatile matter, and the resulting high ash-content and ferruginous coke utilised in the slagging producer. The type of cannel coal referred to would contain 35-40% ash, some 40% volatile matter and 50% total carbon, the ash containing 20-30% iron.

Treatment of Pyrites Cinders

Another field which offers possibilities is the treatment of ferruginous residues, such as pyrites cinders. Such residues can be mixed with low grade fine coal and made into briquettes using pitch or sulphite liquor as binding material. Low grade fines such as "washery silt," containing 25-30% ash and 25-30% volatile matter, are very suitable for this purpose. Another possibility is the use of carbonaceous ironstone, such as blackband ironstone, which mixed with coke and treated by this method should yield gas and silicious iron. An average blackband ironstone contains about 40% ash, 40% volatile matter and 40% total carbon. Part of the volatile matter consists of CO_2, due to decomposition of ferrous carbonate; the ash contains 50-60% iron.

Non-Ferrous Metals from Low Grade Ores

The treatment of low grade ore and metallurgical refuse for extraction of non-ferrous metals offers a wide field in materials which it is considered uneconomical to treat by the usual metallurgical processes. The most promising for treatment by this method would appear to be ores and residues of a complex nature containing several elements in combination, since some of the metals will be volatilised and can be recovered from the gas while others will pass into a matte or find their way into an alloy pig iron.

The application of the slagging producer for the treatment of electrolytic zinc residues has already been described in detail, and residues from zinc retorts containing, say, 4-9% Zn, 2-3% Pb, 15-20% Fe, together with small percentages of other elements, might be similarly treated. Such residues usually contain from 25 to 35% of carbon, and consequently could be treated without the addition of extra fuel. The carbon is recovered in the form of a combustible gas. Lead furnace slag containing 6-10% Zn, 2% Pb, 1% Cu and 25% Fe, when granulated and mixed with coke breeze or coal "fines" and formed into briquettes, is suitable for treatment in the producer, as are complex low grade ores containing zinc, lead, copper and iron. When silver is present in the ore or residue

it passes into the matte if conditions are such that a matte is formed.

Besides residues from metallurgical works and tailings, etc., from mining operations, we have a possible field in the refuse dumps which are to be found in the neighbourhood of disused mines. Some of these dumps have accumulated as the result of mining and metallurgical operations carried out centuries ago. Such dumps are not worked now, because it is not considered economical to do so by ordinary metallurgical means. Particular examples are the refuse dumps found in disused zinc and lead mines in Northern England, Derbyshire and Wales, and at tin mines in Cornwall.

Discussion

Dr. R. Lessing said that in this and other countries there was a vast amount of low grade fuel which might be utilised in such a process as that described in the paper. In coal washing and cleaning operations, for instance, there was a refuse which still contained 20 to 25 per cent. of carbon, which whilst not worth taking away from the colliery because it would not stand the transport costs, had a certain fuel value on the spot and the question was how it could be dealt with, and he had himself in one particular case used quite successfully materials of that type in producers. The work did not involve the feature of slagging, the idea being to get out as much of the carbon as practicable for the purpose of raising steam, and it was very successful. It might be more profitable now to arrange matters so that when the clinkering stage was reached the producer could be run as a slagging process, thereby making its work easier and simpler than would otherwise be the case. It was true that in the case he had mentioned there were no valuable metals to constitute a by-product of considerable value but it might be possible to turn the base material, i.e., the shale and pyrites present in this refuse material, to account.

Mr. A. Sanders, of the National Smelting Co., said there was little doubt that the slagging producer was the producer which marked a great advance on what we have at present when dealing with materials containing carbon, especially when these were allied with recoverable metals. The question of recoverable metals, especially in the non-ferrous metal industry, was a very dangerous subject at the moment, but we must look ahead and hope that the position would improve. There were large accumulations of residues containing non-ferrous metals, such as zinc and lead, at certain silver mines which indicated the possibility that a good deal could be done with them successfully in such a type of producer as had been described. The capital cost of the installation was a serious matter.

Mr. Harald Nielsen said there used to be in Scotland a large number of old blast-furnaces running cold, and they were more or less slagging producers. Again, in Sweden, there were a number of blast-furnaces with very small throughputs, running under more or less the same conditions. At the same time, there was every possibility that the slagging producer described in the paper might be the very thing we had been looking for. In this country particularly there was a large amount of low grade fuel, coke breeze and other unsaleable stuff, which could be briquetted and then treated in this slagging producer. He had in mind one dump which contained 150,000 tons and he had been waiting for ten years for a successful process to deal with it.

Replying to the discussion, Mr. Rambush said he was not at all sure it would be possible to use washery refuse containing 25 per cent. of carbon by itself, economically. It would be necessary to consider possibly mixing it with some other fuel, and, altogether it would depend on the composition and analysis of the whole charge.

Swedish Paper Pulp Industry

THE Swedish Consulate General in London reports that the paper pulp industry exhibits somewhat better sales results, though in comparison with 1930 a not inconsiderable decline has set in for sulphite and mechanical pulp, while sales of sulphate have maintained themselves well. In general, prices have continuously weakened, not least in the case of sulphite pulp, which has experienced a considerable fall in price, in spite of the measures taken by the more important producing countries to adapt production to consumption. Prices have also fallen for mechanical pulp.

Zinc Oxide Industry

TO THE EDITOR OF THE CHEMICAL AGE.

SIR,—I was naturally interested in O. W. Roskill's article on zinc oxide in your last issue and feel indebted to the author for this summary of the position. He will probably not object to a few observations from one inside the industry as some of his statements do not accord with actualities, being possibly derived from records and not first hand knowledge. The prices quoted as London average prices over six and a half years, and particularly those for the last three or four years, are considerably above real market prices. So far as the indirect process is concerned, efficiencies and costs such as those stated would necessitate an increase of prices by £3 or £4 a ton to avoid loss at the prevailing prices of spelter and oxide.

With regard to the comparisons between direct and indirect qualities, only those in close contact with the industry can be aware of the tremendous changes which have occurred during the last two years in the production of indirect zinc oxides. The following facts relative to my own company's products indicate these changes:—

So far as cadmium is concerned we are marketing several grades in which the cadmium content has been so reduced as to be undetectable either by analysis or by its effect on the colour.

With regard to lead, we market three standard grades for paint purposes, in all of which the lead content is maintained below 0.20%, and in one of which it is less than 0.01%.

With regard to particle size, indirect zinc oxides are very much finer than direct qualities, and in the case of one of our special rubber qualities, the particle size is, as near as can be measured, equal to that of the ultra-fine or so-called colloidal oxide produced by the special American process mentioned, which, by the way, is used in conjunction with an indirect process. For this and other reasons it has outstanding effects in vulcanising reactions which have induced American tyre manufacturers to take regular supplies.

In the last year or two the trade position has altered considerably and English oxides are competing successfully in all markets other than those barricaded by insurmountable tariffs. It is because of the recent development of these various aspects that I venture to mention them, as unless Mr. Roskill is in the industry it must be difficult for him to know them. For my part I found his summary most helpful.—Yours, etc.,

THE NEWCASTLE-UPON-TYNE ZINC OXIDE CO., LTD.
(Norman Dawson, Managing Director).

Birtley, Co. Durham,
September 30.

Sir Harry McGowan's Message

Confidence in the Future

THE following message from the Chairman of Imperial Chemical Industries (Sir Harry McGowan) appears in the I.C.I. Magazine for October:—

At such a time as the present, I feel that all those who work with us in I.C.I. would appreciate an expression of my opinion on the position.

The National Government, in a very short time, has balanced the Budget, and, by putting our national finances in order and proving their stability, has relieved the general anxiety. The suspension of the Gold Standard is certainly a step towards the recovery of our trade as a country and particularly as far as our company is concerned.

Some difficulties may arise from the changed conditions, but I am convinced that they will be only of a temporary nature and I look forward with confidence to the future.

The third and next step which I feel essential is the institution of properly regulated and scientific tariff measures in this country in order to supplement the improved industrial situation that the devaluated pound will create.

It is as yet too early to say what will be the effect on our position as the centre of world finance, but probably the inherent knowledge of world banking and the general stability of the British character will always assist London to be a world financial centre.

I and my colleagues on the Board are encouraged by the knowledge that we have the active co-operation of our staffs, technical, commercial and operative.

The Work of the Government Laboratory

Report for the Year 1930-31

ACCORDING to the Report of the Government Chemist upon the work of the Government Laboratory for the year ending March 31, 1931 (H.M. Stationary Office, price 9d. net) the total number of samples examined in the course of the year was 517,462, a decrease of 27,960, compared with the preceding year. These figures include samples examined at the Chemical Stations established at the more important seaports where certain classes of goods have to be tested for Customs and Excise purposes, in addition to those dealt with at the Central Laboratory, Clements Inn Passage, London, and at the London Customs House.

A Case of Fertiliser Reversion

During the year, three fertilisers and eight feeding stuffs were examined, no sample being received from a buyer or seller. Of the fertilisers two were mixed fertilisers and the third a substance sold as bone meal. One of the fertilisers contained one-fiftieth of the declared quantity of phosphoric acid, and reversion of soluble phosphate, probably caused by contamination with calcium carbonate in the mill, had reduced the soluble phosphoric acid beyond the limit allowed by the Regulations. Vitriolised bone had been substituted for the bone meal, which contained less phosphoric acid than that expected from the statutory declaration. The feeding stuffs included barley meal, meat meal, meat and bone meal, laying meal, biscuit meal, ground oats, and maize gluten meal. Deficiencies, in excess of the limits allowed by the Regulations, in oil and/or protein were found in the laying meal, biscuit meal and two meat meals. Ten per cent. of barley was found in a sample of ground oats. Sand in greater proportion than the maximum expected to be present in well-screened barley was present in a barley meal. A sample of meat and bone meal contained common salt in excess of the proportion allowed by the statutory definition, and maize meal, containing a lower proportion of protein, had been sold as maize gluten meal.

Hydrocarbon Oils

The Hydrocarbon Oils Duty has involved this year, as in the previous year, the examination of over 10,000 samples for assessment of duty on importation, or drawback of duty on exportation. The samples consisted largely of articles in which hydrocarbon oil was one of the ingredients and the quantity and character of the oil had to be determined. Many samples which are examined for oils may contain other dutiable substances, such as alcohol, esters, and chemicals on the Key Industry List, which must be tested for and determined if present.

The meaning of the expression "light oils" for the purposes of the petrol duty is given in the Act as: "Hydrocarbon oils of which not less than 50 per cent. by volume distils at a temperature not exceeding 185° C., or of which not less than 95 per cent. by volume distils at a temperature not exceeding 240° C., or which gives off an inflammable vapour at a temperature of less than 22.8° C. when tested in the manner prescribed by the Acts relating to petroleum." No difficulty has been experienced in applying this specification, and it may be said that practically no hydrocarbon oils described as "heavy oils" came within the specification for "light oils." In the administration of this duty it has been necessary to examine a large number of samples of imported goods to determine the duty payable, and of exported goods to check the declarations of traders making claims for repayment of duty on account of duty-paid oils used as ingredients in the manufacture or preparation of the goods in question. As in the case of other duties, such as sugar and cocoa, fixed rates of duty have been established for goods regularly imported and exported, so as to reduce the examination to samples taken for periodic checks. Of samples examined 7,495 were from imported and 2,724 from exported goods. Of these, 5,703 consisted of hydrocarbon oils, and 4,516 were miscellaneous composite goods such as enamels, lacquers, leather colours, paints, varnishes, garage preparations, road dressings, solvents, insecticides, medicinal and toilet preparations, essential oils, etc.

Life of Spirit Hydrometers

Owing to the increasing production of alcohol of high strength the range of the spirit hydrometers in use by the Customs and Excise had to be extended. A new instrument Sikes' "B" Hydrometer, capable of indicating the highest alcoholic strengths at all temperatures likely to be experienced in this country has therefore been devised, and, with the appropriate tables legalised by regulations issued by the Commissioners of Customs and Excise under the Finance Act, 1907, 7 Edward 7, c. 13, Section 4. Reference "B" instruments have been prepared and 30 hydrometers for issue to the Customs and Excise have been calibrated. The results of an investigation made in the laboratory during the past year indicate the possibility that the plating of hydrometers and saccharometers with nickel and chromium may prolong the life of the instruments and afford more accurate determinations of strength and specific gravity. A few instruments thus plated are now being prepared for trial over a period of some months under ordinary working conditions, in order to ascertain whether the advantages indicated are confirmed in practical conditions of use.

Imported Methyl Alcohol

Wood spirit (methyl alcohol) is not liable to spirit duty on importation unless purified so as to be potable, in which case it is dutiable as ordinary spirits. Of 79 samples of methyl alcohol, nine were found liable to duty on the ground of potability. Forty-five samples of fusel oil from British distilleries were examined. Of these, 13 were found to contain more than 15 per cent. of proof spirit, and delivery out of revenue control was refused until the proportion of spirit had been reduced.

A total of 670 samples of wood naphtha including other crude methyl alcohol and mineral naphtha and 147 samples of pyridine and dyes intended for use in the manufacture of methylated spirits were examined. Except in two instances the materials represented by the samples were approved as fit for methylating purposes. For the purpose of controlling methylated spirits or spirits other than methylated spirits used free of duty in connection with manufacturing operations, 2,214 samples of special denaturants, specially denatured alcohol, recovered spirits, residues from stills and articles manufactured with industrial methylated spirits were examined.

During the year, 12,835 samples were examined under the Safeguarding of Industries Act, 1921, the object of the examination in most cases being to ascertain (a) whether the chemical was such as to come within the class of those liable to duty; or (b) whether, in the case of substances bearing trade names without indication as to their ingredients, such as medical preparations, the imported article contained any substance liable to duty, and, if so, in what proportion. Twenty-five samples of imported coloured goods were examined to ascertain whether they contained synthetic organic dyes, the importation of which under the Dyestuffs (Import Regulation) Act, 1920, is prohibited except under licence. Ninety-six samples were submitted under the White Phosphorus Matches Prohibition Act, 1908. None of the samples showed any evidence of the presence of white phosphorus.

Normal Duties of the Laboratory

The present technical staff of the Department consists of the Government Chemist, Deputy Government Chemist, 6 superintending chemists, 12 chemists (Class I), 27 chemists Class II) and 39 temporary assistant chemists. In addition to the above there are 91 laboratory assistants and 36 officers of Customs and Excise in the Department for training for service at the Chemical Stations. The Chemical work performed by the Laboratory is normally that requested by the Admiralty, Ministry of Agriculture and Fisheries, Department of Agriculture for Scotland, Air Ministry, Colonial Office, Board of Customs and Excise, Fishery Board for Scotland, Ministry of Health, Board of Inland Revenue, Ministry of Pensions, Post Office, Department of Scientific and Industrial Research, Scottish Department of Health, Home Office, Board of Trade, War Office, Privy Council and Office of Works.

Heavy Chemical Industry in India

Tariff Board's Recommendations

IN their Report on the heavy chemical industry, drawn up in 1929, but only recently made available for publication, the Indian Tariff Board do not recommend the removal of the import duties on those chemicals which are used as materials in Indian industries, on the ground that no substantial relief of the burden on industries is likely to result. The following increases and alterations of duties are recommended but it must be borne in mind that these recommendations were made prior to the enforcement of the special surtaxes imposed in 1931, and do not, therefore, take these surtaxes into account:—

Hydrochloric acid—Rs. 2-9-0 per cwt., or 15 per cent. *ad valorem*, whichever is higher.

Nitric acid having a density of 15° C.: Not more than 1.42 gm. per c. cm.—Rs. 3-10-0 per cwt., or 15 per cent. *ad valorem*, whichever is higher. More than 1.42 gm. per c. cm.—Rs. 5-3-0 per cwt., or 15 per cent. *ad valorem*, whichever is higher.

Sulphuric acid—Rs. 1-4-0 per cwt., or 15 per cent. *ad valorem*, whichever is higher.

Alum, viz., ammonia alum, potash alum or soda alum—As. 15 per cwt.

Aluminium sulphate or hydrated aluminium sulphate, including alumino-ferric and alum cake: Containing not more than 0.01 per cent. of iron—As. 13 per cwt. Containing more than 0.01 per cent. of iron—As. 9 per cwt.

Copperas—As. 2 per cwt.

Copper sulphate or hydrated copper sulphate—Rs. 3 per cwt.

Magnesium sulphate or hydrated magnesium sulphate: Containing not more than 50 per cent. of magnesium sulphate—Rs. 1-4-0 per cwt. Containing more than 50 per cent. of magnesium sulphate—Rs. 2-8-0 per cwt.

Sodium sulphate or hydrated sodium sulphate: Containing not more than 50 per cent. of sodium sulphate—As. 6 per cwt. Containing more than 50 per cent. of sodium sulphate—As. 13 per cwt.

Sodium sulphide or hydrated sodium sulphide—Rs. 1-7-0 per cwt.

Zinc chloride or zinc chloride solution—Rs.4-5-0 per cwt.

It is further recommended that power should be conferred on the Governor-General in Council to increase these duties in the event of a decline in the price of imports.

Manufacturing Sulphuric Acid in India

The basis of the whole group of chemicals considered in the report is sulphuric acid. The heavy sea freight on acids has afforded a high natural protection to the manufacture of sulphuric, hydrochloric and nitric acids in India with the result that it has proved profitable to manufacture these acids on a small scale at a high cost, but since the salts dependent upon the acids do not enjoy the same natural protection it has proved difficult for the Indian manufacturer of these salts to compete against imports from other countries in which the industry is highly developed. Examination of the industry's claim to protection leads the Board to the following conclusions. The total market in India (excluding Burma) for these chemicals in terms of sulphuric acid is at present about 12,000 tons and in a few years may reach 16,000 tons. This market is sufficiently large for the production of chemicals on an economic scale. The machinery required for manufacture is simple in operation and easily handled by Indian labour: fuel which is an important item, is abundant and cheap. In the matter of the supply of raw materials, while India possesses several of those required, the most important material, namely sulphur, is at present lacking; but India is in this respect at no disadvantage compared with the two principal competing countries, England and Germany. The absence of a supply of indigenous sulphur, however, is not considered a bar to the grant of protection.

The Board have estimated that if the manufacturing unit were to attain an annual output of 8,000 tons of chamber acid, a quantity for which they consider that in the next few years a market would be found in Western India alone, the fair selling price of acid would be Rs. 55 a ton, a figure comparing very favourably with the price of sulphuric acid of the same strength in any other part of the world.

Suggested Bounty for Superphosphate

On the ground that a close connection exists between the chemical industry and the manufacture of ammonium sulphate and superphosphate, in the production of both of which sulphuric acid plays an important part, the Board have also included within the scope of their enquiry the question whether steps should be taken to foster the manufacture in India of these two fertilisers. They have arrived at the conclusion that, while the manufacture of ammonium sulphate requires no assistance, the manufacture of superphosphate should be protected by the grant of a bounty payable on the first 10,000 tons of superphosphate produced in a year by any individual factory of which the annual output is not less than 2,000 tons, the rate of the bounty to be twelve annas per unit of soluble phosphoric anhydride. The payment of this bounty should be subject generally to the conditions laid down in the Steel Industry (Protection) Act, 1924, and the maximum liability of Government should be fixed at 7 lakhs of rupees annually for a period of seven years.

The two most important consuming centres for the chemical industry are Calcutta and Bombay, and while as regards the cost of production Calcutta is the cheaper centre owing to the vicinity of the coalfields, Bombay provides the larger market for certain chemical products. From the Board's estimate of comparative costs it would appear that, even with freights reduced as proposed by them, the Calcutta manufacturer, so long as his average production does not exceed 8,000 tons of sulphuric acid, could not, except in the case of two products, enter the Bombay market except at a heavy loss and that it would be still more difficult for the Bombay manufacturer to enter the Calcutta market.

Magnesium Chloride Industry

In their separate Report on the magnesium chloride industry, the Tariff Board recommend the imposition on magnesium chloride of a duty of As. 7 per cwt., which is estimated to correspond to the duty of 15 per cent. *ad valorem* which was removed in 1927. By a resolution published at Simla, September 4, the Government of India have now accepted this recommendation.

Oil from Coal

Production Costs Announced by I.C.I.

IT has been officially announced at the Office of Imperial Chemical Industries, Ltd., Billingham-on-Tees, that "petrol of a quality equal, if not superior, to the finest natural spirit can now be made from coal at a cost of 7d. per gallon." The present price to private consumers of No. 1 petrol is 1s. 3½d. per gallon, including tax, at which price similar quality spirit could therefore be manufactured from British coal, and retailed to the public to show a profit on the undertaking.

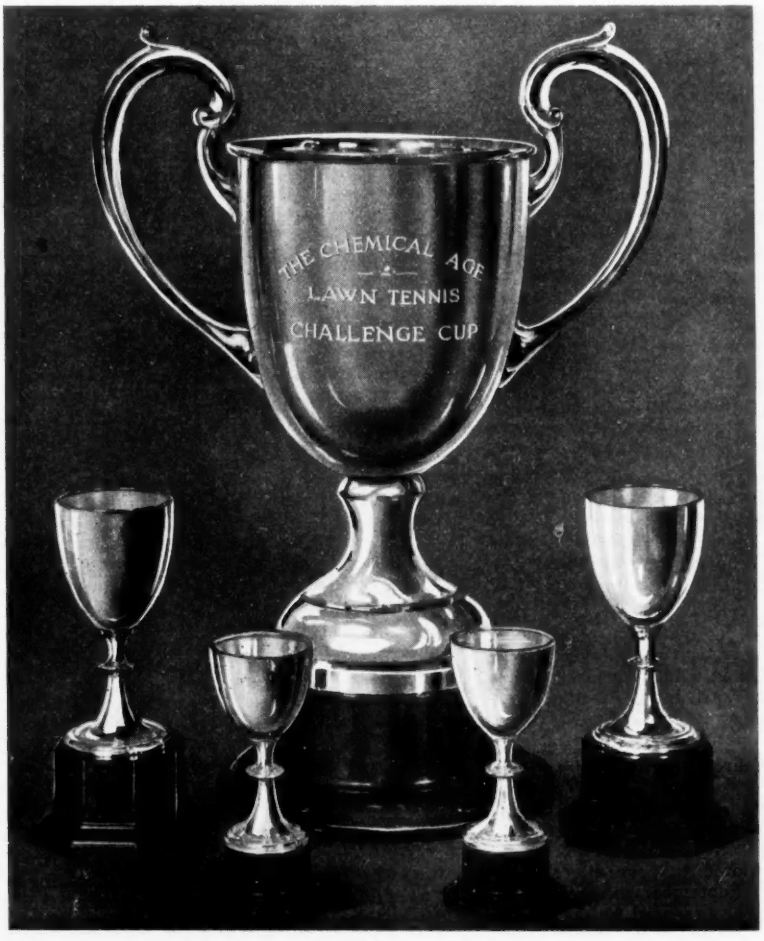
It is estimated that the Imperial Chemical Industries' scheme, which envisages the manufacture of 213,000 tons of petrol per year, would involve a capital outlay of £7,000,000 to £8,000,000, provide employment for 5,000 men, and absorb 850,000 tons of coal annually. The success of the process would, of course, involve the Exchequer in a net loss of some £1,500,000 per annum on account of reduced receipts from petrol duty, but against this must be placed the direct and indirect saving on the Unemployment Insurance Fund, the stimulus of a prosperous industry in a depressed area, and the decreased payment of British money for foreign oils.

Abrasive Products and Merchandise Marks Act

THE BOARD OF TRADE announce that they have referred to the Standing Committee appointed by them under the Merchandise Marks Act, 1926, an application for the making of an Order-in-Council to require imported abrasive wheels and stones (consisting of grains of natural or manufactured abrasive bonded together with other material) to bear an indication of origin. Representatives of any interests affected by the application who desire to be heard in opposition at the Public Enquiry, which will be held by the Committee, should communicate with the Secretary, Mr. E. W. Reardon, at the Board of Trade Offices, Great George Street, London, S.W.1, not later than October 31.

Chemical Industry Lawn Tennis Tournament

THE accompanying illustration shows the group of Silver Cups presented to the finalists in the Chemical Industry Lawn Tennis Tournament, organised by THE CHEMICAL AGE, which was successfully brought to a conclusion last month. The handsome Silver Challenge Cup in the centre, which was kindly given by Benn Brothers, Ltd. (proprietors of THE CHEMICAL AGE), will be held for twelve months by the firm represented by the winners, and will be competed for annually. As a result of the generosity of Graesser-Monsanto Chemical Works, Ltd., four small cups were awarded to the finalists and these become the personal property of the winners and the runners-up. The winners, as announced in our issue of September 19, are Mr. S. Newman and Mr. E. J. Lawrence, of London, and the runners-up, Mr. S. B. Gane and Mr. D. E. Raine, of Johnson, Matthey & Co., Ltd., Birmingham.



Although this was the first time in the history of THE CHEMICAL AGE that such a tournament had been arranged and only short notice was given before the closing date had to be announced, a very gratifying number of entries was received and the Tournament was followed with the keenest interest throughout by many firms in the chemical industry. Among the leading companies represented were—Imperial Chemical Industries, Ltd., British Industrial Solvents, Ltd., British Drug Houses, Ltd., Johnson Matthey & Co., Ltd., Boots Pure Drug Co., R. W. Greeff & Co., Ltd., Graesser-Monsanto Chemical Works Ltd., Chemicals & Coke Ovens, Ltd., Bakelite, Ltd., George T. Gurr, Le Grand, Sutcliff and Gell, Ltd.

The efficient way in which all the competitors carried through the arrangements for playing off their matches in the various rounds, especially in those cases where they were obliged to travel considerable distances, greatly assisted the organisers and added to the smooth working of the Tournament. It may be noted with satisfaction that throughout the competition it was necessary to scratch only two matches. Judging by the letters of appreciation received from the competitors and others, some exceedingly interesting games were played and a number of enjoyable meetings were arranged. The organisers are confident that in view of the success of this year's tournament, a greatly increased number of entries will be sent in next year.

The Hydrocarbon Oils Duty

As there appears (it is stated in *The Times* City Notes) to be misunderstanding in some quarters as to the scope of the hydrocarbon oils duty, commonly referred to as the petrol tax, it may be worth while to recapitulate the history of the tax. A duty of 4d. per gallon was originally imposed by the Finance Act, 1928, on all imported hydrocarbon oils, but a rebate of a corresponding amount was allowed on such of these oils as did not come within the definition of "light oils." "Light oils" included motor spirit, white spirit, and turpentine, which although a vegetable oil is an active competitor with white spirit and is used extensively in the paint and varnish industry. The duty and rebate were increased by 2d. per gallon under the Finance Act this spring, and a further 2d. has now been added, making 8d. per gallon in all. This duty is payable on all imported petrol (and white spirit and turpentine) sold in this country, whether or not it is imported as such or obtained by the refining of imported crude oil or the "cracking" of imported heavy oils, refining and "cracking" being carried on in bonded premises and the duty paid on the quantity of taxable products taken out of bond. The Budget which the Chancellor introduced recently provides for one important alteration in the scope of the tax by stipulating that where a hydrocarbon oil on which a rebate has been allowed is mixed with motor spirit the rebate shall be forfeited. This alteration in the duty became necessary owing to the growing tendency on the part of certain of the smaller oil companies to market a "cheap" petrol which consists of a substantial proportion of untaxable kerosine and distillate, with corresponding loss to the revenue.

Development of New Diatomite Deposits

A CONCERN known as Diatomite Products, Ltd., of Toronto (Canada), is taking steps to develop the diatomaceous mud occurring in certain lake beds near Huntsville, in the Muskoka district of Ontario. The mud will be pumped out by a suction dredge and calcined for the recovery of the diatomite. The calcining furnace is being constructed and the new industry is expected to come into operation at an early date.

From Week to Week

RECENT WILLS include:—Sir Hugh Bell, Bart, late chairman of Dorman, Long & Co., Middlesbrough, who died in June, £68,038.

FOLLOWING HIS APPOINTMENT as Minister of Transport, Mr. P. J. Pybus has resigned his directorships in British Portland Cement Manufacturers, Ltd., and Associated Portland Cement Manufacturers, Ltd.

THE COAL INDUSTRY of Great Britain had a working loss of £264,566, or 1.34d. per ton in the quarter ended June 30. The net costs of production were £33,094,540, and the proceeds of the output of 47,532,035 tons of coal disposable commercially were £32,829,974.

IN CELEBRATION OF THE CENTENARY of the British Association the University of London has conferred the degree of Doctor of Science *honoris causa*, on General Smuts, the president of the Association, 1931, and on Professor Sir Frederick Gowland Hopkins, Sir Charles Scott Sherrington, Lord Rutherford and (in absentia) Sir Joseph (John) Thomson.

ON THE OCCASION of their quarterly meeting, held at Paisley, this week, the Western Branch of the Sanitary Inspectors' Association of Scotland paid a visit of inspection to the Burnbank Chemical Works of William Forrest & Son, Ltd., Paisley, where the various processes were demonstrated to the visitors.

MEMBERS OF THE BRITISH ASSOCIATION (Agricultural Section) led by Sir John Russell, the director of the Rothamsted Experimental Station, visited Jealott's Hill, the research station of Imperial Chemical Industries, Ltd., near Bracknell, Berkshire, on Sunday, September 27. Particular interest was shown in the large scale experiment started this year to examine the conditions affecting cereals.

THE RUSSIAN OIL TRUST, which controls all the oil wells and refineries in the Soviet Union, is to be reorganised at the beginning of next year as it has failed to pay. The Trust will be transformed into four cartels, nine trusts and two research institutes, to work independently of each other. It is hoped that after this reorganisation the State will no longer have to pay subsidies.

IT IS ANNOUNCED by the directors of the International Nickel Co. of Canada that, in order that shareholders should not be delayed in their receipt of dividend payments, the warrants for Common dividend prepared prior to the recent exchange fluctuations were posted on September 30. Supplemental dividend warrants, calculated to give effect to the dollar exchange rate current on September 30, are to be posted as soon as the warrants can be prepared.

THE PRESIDENT-ELECT OF THE INSTITUTE OF FUEL, Sir Hugo Hirst, Bart., will be installed in the presidential chair by Sir David Milne-Watson, at a meeting to be held at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W., at 6.0 p.m., on Tuesday, October 20. This ceremony will be followed by his presidential address and a short paper by Mr. B. Pochobradsky on selected problems relative to the coal industry, open for discussion.

REPRESENTATIVES of Canadian, Belgian, Rhodesian and United States copper producers are meeting in New York this month to consider the copper surplus plan providing for a curtailment of world production to 90,000 tons a month. This is 28 per cent. below the recent average. Current world consumption is about 105,000 tons a month, but the producers have chosen a lower figure owing to being unable to control Japanese, Russian, and German production, which averages 13,500 tons a month.

ACCORDING to information from Sheffield, with the departure of British currency from the Gold Standard, and the possibility of protective tariff walls, consumers of pig iron are becoming perturbed about future supplies. In August last the national production of pig iron amounted to 275,700 tons as compared with 416,700 tons in the corresponding month last year. During the last few years considerable blastfurnace plant has been dismantled. Two years ago 165 furnaces were in blast, 37 of which were hematite. To-day there are 64 furnaces in operation, of which only 16 produce hematite iron.

THE ALBERT PAPER MILLS, RETFORD, which have been idle for many months, have been purchased by the paper making firm of Spicers, Ltd., who will employ about forty workers.

MR. T. HEDLEY BARRY announces that he has transferred his office to The Laboratory, 84 Fetter Lane, London, E.C.4, which will now be his only address. His telephone number is Holborn 8522.

THE BUSINESS OF Shawinigan Stainless Steel & Alloys, Ltd., will, in future, be carried on as the Stainless Steel & Alloys Division of Shawinigan Chemicals, Ltd. The Shawinigan Falls foundry, manufacturing Duriron, alloy and steel castings, will continue under the same management.

BETWEEN 300 and 400 members of the staff and employees of Bickford Smith & Co., safety fuse manufacturers, Camborne, were present at the interment last week of the remains of Mr. C. E. Tyack, works manager, of the Tuckingmill factory.

THE EUROPEAN CYANAMIDE EXPORT CO., LTD., having ceased to operate, the sale of calcium cyanamide has now been entrusted to Shaw, Scott & Co., Ltd., of Winchester House, Old Broad Street, E.C.2, whose manager was formerly the general sales manager of the European Cyanamide Export Co.

THE RUHR CHEMIE A.G., ESSEN, the nitrogen company of the Ruhr collieries, was kept working by the Nitrogen Syndicate in 1930-31 to an average of only 36 per cent. of capacity. The loss, however, was reduced from Rm.2,690,000 in the previous business year to Rm.1,070,000. The capital of the company amounts to Rm.9,000,000 paid up.

SOUTH WALES INDUSTRIALISTS visited the Imperial Chemical Industries' hydrogenation plant at Billingham on Thursday, October 1. The party included Mr. Iestyn R. Williams, assistant secretary to the South Wales Coalowners' Association; Mr. W. D. Woolley, Tredegar; Mr. J. H. Lones, Blaenavon; Mr. T. J. Major, Cardiff, and Mr. T. G. Watts, of the Powell Duffryn Co.

THE FOLLOWING CHANGES are announced in the Board of Cosach:—Messrs. J. H. Vergera and J. P. Benvenuto have been appointed directors representing the Series "A" Shares in place of Pablo Ramirez and Rodolfo Jaramillo, resigned; R. L. Barahona has been appointed a substitute director representing the Series "A" Shares in place of M. B. Castanon, resigned.

IMPROVEMENT in the South Durham coke trade has resulted in Pease & Partners, Ltd., deciding to put another battery of sixty ovens in commission at their Bankfoot Cokeworks, Crook. These ovens were closed down in May last, and, in addition to throwing the staff out of employment, the reduced demand for coal from the firm's neighbouring colliery at Roddymoor resulted in nearly 400 men being dispensed with there.

ACCORDING to the *Journal of Commerce*, four former employees of the Atmospheric Nitrogen Corporation, a branch of the Allied Chemical Co., sailed from New York this month for Soviet Russia to act in a supervisory capacity in connection with the nitrogen plant recently completed in the eastern part of the Soviet Republic by a firm of American contractors. The men will be given an opportunity, on the expiration of their contracts, which are for one year, to train a corps of workers for a factory to be erected near Moscow next year.

MELDRUMS, LTD., of Timperley, near Manchester, report that their works have been normally employed during the past three months, and orders for 50 plants of substantial size have been received during that period. These consist chiefly of refuse destructors with boilers or water heaters for the utilisation of the heat of combustion; mechanical stokers and forced draught furnaces for eliminating smoke, utilising cheaper fuel and giving increased steaming from existing boilers. They also find an increased demand for chemical plant constructed in their well-known "Meldrum" acid resisting metal.

Obituary

THOMAS WHINYATES, late chief accountant of the United Alkali Co., Ltd., October 1, aged 68 years.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

350,499. DYES. D. A. W. Fairweather, J. Thomas and Scottish Dyes, Ltd., Earl's Road, Grangemouth. Application date, December 9, 1929.

Esters of reduced indanthrones, *e.g.*, disulphuric ester obtained by treating indanthrone with pyridine-sulphur trioxide in the presence of a metal and a tertiary base are developed in substance or on the fibre by mixtures of ferrous and ferric salts in the presence of acid. The ferric salt may be replaced by an oxidising agent which converts some of the ferrous salt to the ferric state.

350,501. DYES. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 13, 1929.

A 1-arylimino-anthraquinone-2-aldehyde or -2^1-aldehyde having a free position ortho to the imino group in either the anthraquinone or benzene nucleus is halogenated in the presence of halogenating catalysts and acid neutralising agents. Examples are give of the treatment of 1-phenylamino-anthraquinone-2^1-aldehyde and 2-aldehyde, 1-(2^1 : 4^1 : 5^1-trichloro - phenylamino) - anthraquinone-2-aldehyde, 1 : 5-diphenylamino-anthraquinone-2^1 : 2^{11}-dialdehyde and 1-phenylamino-6- or -7-dichloranthraquinone-2^1-aldehyde.

350,502. ALCOHOLS. Imperial Chemical Industries, Ltd., Millbank, London, J. W. Armit, 18 Woodcote Park Road, Epsom, Surrey, and G. E. Wainwright, Norton Hall, The Green, Norton-on-Tees. Application date, December 13, 1929.

Alcohols obtained by catalytic hydrogenation of carbon monoxide, *e.g.*, methanol and butanol fractions, are purified by distilling with caustic alkali, with or without brine, and then adding small quantities of a primary amine of higher boiling point, *e.g.*, aniline, and phosphoric or sulphuric acid, and then fractionating. The two operations are carried out continuously.

350,539. SEPARATING MIXTURES OF AMINES. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, March 12, 1929.

A mixture of a primary aliphatic amine and secondary and/or tertiary aliphatic amines is treated with a high-boiling aromatic aldehyde, *e.g.*, benzaldehyde, to form a benzylidene compound with the primary amine. The secondary or tertiary base is distilled off, and the remaining compound treated with a mineral acid to separate the mixture of aldehyde and primary amine, while passing steam through the liquid. Benzaldehyde is recovered in the distillate and the residual liquid rim into excess of alkali and the amine distilled off. Examples are given of the separation of ethylamine from diethylamine and triethylamine.

350,564. THIOURAM MONOSULPHIDES. A. Carpmael, London. From I. G. Farbenindustrie Akt.-Ges. Frankfort-on-Main, Germany. Application date, March 14, 1930.

These are obtained by the action of phosgene on a salt of a dithiocarbamic acid disubstituted on the nitrogen atom, either symmetrically or asymmetrically. Examples are given of the action of phosgene on salts obtained from dimethylamine, carbon disulphide and caustic soda, from piperidine and carbon disulphide, and from hexahydro-ethylaniline carbon disulphide and caustic soda.

350,575. DYES. A. Carpmael, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 15, 1930.

One mol. of phenyl-dichlor-1 : 3 : 5-triazine is treated with two mols. of an aminoanthraquinone or a nuclear substitution product, *e.g.*, 1-aminoanthraquinone, 1-amino-5-benzoylamino-anthraquinone, 1-amino-4-benzoylamino-anthraquinone, or 1-amino-4-methoxyanthraquinone, or the hydrohalide salts, in an organic diluent and an acid-fixing agent. The products dye yellow, orange and red.

350,577. DYES. British Celanese, Ltd., 22 Hanover Square, London, and G. H. Ellis, of British Celanese, Ltd., Spondon, near Derby. Application date, January 9, 1930.

Materials containing cellulose esters or ethers are dyed with unsulphonated azo dyes obtained by coupling 1-phenyl-3-methyl-5-pyrazolone with diazo compounds carrying in *p*-position to the diazo group an amino, substituted amino, or hydroxy group, or with diazo compounds carrying in such *p*-position a group which is converted into an amino, substituted amino or hydroxy group. Several examples are given.

350,862. DYES. W. W. Groves, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 9, 1930. Addition to 334,878 and 334,919. (See THE CHEMICAL AGE, Vol. XXIII, page 460).

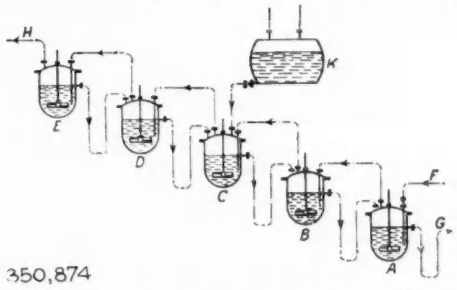
4 : 7 : 4^1 : 7^1-Tetramethyl-5 : 5^1-dichlorthioindigo is treated with an alkali and a reducing agent other than hydrosulphide, and the solution then treated with carbonic acid or sulphurous acid to separate a reduction product.

350,867. ANHYDRIDES OF HALOGEN ALIPHATIC ACIDS. I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, October 19, 1929.

A solution or suspension of a salt of halogen acid in a liquid ester or anhydride is treated with sulphuryl chloride or its components, or with another acid chloride or chlorme in presence of a chlorine carrier to obtain the anhydride of the halogen aliphatic acid. In examples, sodium trichloracetate is suspended in acetic ester and treated with sulphuryl chloride, calcium dichloracetate in acetic or benzoic ester is treated with benzene sulphoric acid chloride, sodium chloracetate in ethyl oxalate is treated with phosgene, and calcium trichloracetate in acetic anhydride is treated with chlorine in presence of sulphur chloride.

350,874. ACETATE ACID. C. F. Boehringer and Soehne, Ges., Waldhof, Mannheim, Germany. International Convention date, November 15, 1929.

A series of vessels A . . . E contain acetaldehyde dissolved in acetic acid or a chlorinated hydrocarbon, or may contain the solvent alone, and a catalyst. Acetaldehyde is supplied to the middle vessel C from vessel K, and oxygen is supplied at F. Each vessel is provided with a stirrer and heating or



350,874

cooling means. In the vessels C, B, A, acetaldehyde and oxygen flow in counter-current, and acetic acid is drawn off at G. Acetaldehyde vapour passes with the oxygen through vessels D, E and waste gases pass off at H. The position of the vessel C is so chosen that the oxygen passing in one direction and the acetaldehyde in the opposite direction are completely utilised.

350,928. DYES. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 17, 1930.

Aminoanthraquinone derivatives containing as nuclear substituents the group——$CON\langle^{R}_{R_1}$ (in which R and R_1 are H, alkyl or aryl) and one further auxochrome group are obtained by converting an aminoanthraquinone-carboxylic acid or acid

halide into its amide, alkylamide or arylamide, or saponifying a corresponding nitrile to its amide, and if the initial material does not contain a further auxochrome group, introducing such a group. Alternatively, the starting material may be a nitroanthraquinone-carboxylic acid or acid halide, and the nitro group is reduced to an amino group. In another alternative, the starting material may be an anthraquinone carboxylic acid or acid halide and an amino group is subsequently introduced in addition to the further auxochrome group. In an example, 1-aminoanthraquinone -2-carboxylic acid chloride is heated with aqueous ammonia, the amide purified by crystallising from monochlorbenzene, the product nitrated and the nitro group reduced with sodium sulphide to obtain 1 : 4-diaminoanthraquinone-2-carboxylic acid amide. Several other examples are given. The products are dyes for cellulose esters or ethers.

350,992. ESTERS AND CONDENSATION PRODUCTS THEREOF. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, December 16, 1929.

Sorbitol is esterified with monobasic aliphatic carboxylic acids containing at least ten carbon atoms. The products may be polymerised by heating with sulphur or agents which split off sulphur or may be polymerised and/or oxidised with air, oxygen or hydrogen peroxide. In an example, sorbitol and linoleic acid are heated to obtain a viscous drying oil for the production of linoleum or varnishes. The oil may be thickened by blowing with air in the presence of oxygen transferrers. Other products are described, obtained from sorbitol and ricinoleic acid, montan wax, and soya bean oil with acids of china wood oil.

351,013. SULPHONATED FATS. H. T. Böhme Akt.-Ges., 29 Moritzstrasse, Chemnitz, Germany. International Convention date, March, 21, 1929.

Sulphonated fatty acids and esters containing at least 9 carbon atoms in the molecule are freed from unsulphonated constituents by neutralising and washing with solvents such as trichlorethylene in the presence of sufficient water to form two layers. The lower layer containing lactones of the higher fatty acids in the solvent is separated and the solvent distilled off.

351,016. ACETALDEHYDE. G. F. Horsley, Norton Hall, The Green, Norton-on-Tees, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, March 19, 1930.

A mixture of acetylene and steam is passed over a catalyst consisting of boron trioxide combined with a non-volatile acid such as phosphoric acid, at 200°-400° C. to obtain acetaldehyde.

351,032. DYES. J. Y. Johnson, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, February 21, 1930.

Anthraquinone-1 : 2 : 2^1 : 1^1-azine is obtained by the oxidation of the dihydroazine and is treated with paraformaldehyde in concentrated sulphuric acid and heated, or chlorinated with sulphuryl chloride.

351,068. QUINOLINE DERIVATIVES. A Carpmael, London. From I. G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, March 22, 1930.

Intermediates for the manufacture of dyestuffs and therapeutic substances are obtained by converting 5-halogen-6-alkoxy-8-nitroquinolines into 5 : 6-dialkoxy-8-nitroquinolines and reducing the products to the amino compounds. Several examples are given.

351,185. PHTHALIC ANHYDRIDE. Imperial Chemical Industries, Ltd., Millbank, London, International Convention date, May 11, 1929.

Phthalic anhydride is obtained by the catalytic oxidation of naphthalene in a chamber of a metal not readily oxidised, such as nickel or whose oxide is too weakly basic to form phthalates, such as aluminium. The catalyst may be vanadium pentoxide. The use of the above metals avoids the production of maleic acid as a by-product.

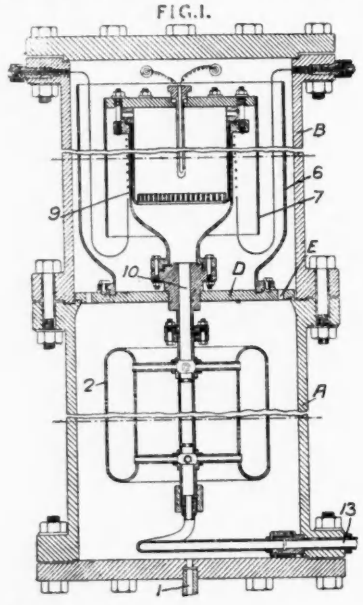
351,318. VINYL ESTERS. Imperial Chemical Industries, Ltd., Millbank, London. International Convention date, August 28, 1929.

A lower mono-carboxylic acid of the aliphatic series is treated below 25° C. with acetylene at such a rate that the gas is completely absorbed, in the presence of a mercury compound, sulpho-acetic acid, and acetic anhydride. Sodium or calcium acetate is added, and the product distilled at reduced pressure.

350,643. CATALYTIC APPARATUS FOR AMMONIA SYNTHESIS. Soc. Anon. Industria Ammoniaca and F. Lopez, 12 Via Zabarella, Padua, Italy. Application date, April 9, 1930.

The reaction mixture enters chamber A at 1 and then passes through perforations E in a horizontal separating partition into the upper chamber B. The mixture passes around baffles 6, 7, and then enters the reaction chamber 9, which is

FIG.1.



350,643

surrounded by a heating element. The products pass downwards through tube 10 to an annular chamber 2 in the chamber A, in order to preheat the incoming gas. The internal parts are all free to expand without straining the outer casing.

350,726. PROTECTIVE COATING FOR VATS. H. O. Kauffmann, 3 Achalmstrasse Reutlingen, Wurtemberg, and Electro-Chemische Werke Munchen, Akt.-Ges., Hollriegelskreuth, near Munich, Germany. Application date, June 18, 1930.

A protective coating for vessels used for bleaching textiles with hydrogen peroxide consists of free lime with a small proportion of Portland cement. The coating is allowed to become partly dry and is then washed with a solution of alkali silicate and carbonate.

350,728. TREATING ZIRCONIUM ORES. Deutsche Gasglühlicht-Auer-Ges., 16 Rotherstrasse, Berlin. International Convention date, June 29, 1929.

Silicious zirconium ores are treated with about one molecular proportion of alkali hydrate at 500° C. or alkali carbonate at 900° C. The product is dissolved in a strong mineral acid and then evaporated to dryness to render the silica insoluble, after which the zirconium salt is leached out with water.

350,735. MANGANESE RESINATE. British Thomson-Houston Co., Ltd., Crown House, Aldwych, London. Assignees of P. S. Miller, 302 S. Ten Broeck Street, Scotia, New York. International Convention date, June 20, 1929.

Manganese resinate, which is soluble in mineral oil and may be used as a drier for varnishes, is obtained by fusing rosin at 250° C., adding manganese dioxide slowly, and raising to 310°-315° C.

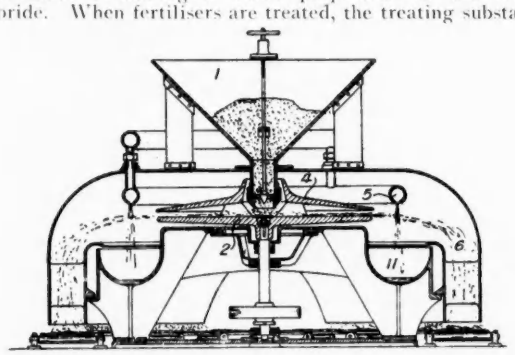
351,026. SOLUBILISING PHOSPHATES. J. Margoles, 68 Rue des Martyrs, Paris. Application date, January 17, 1930.

Crude tricalcium phosphate is treated with nitric acid in the presence of an oxidising salt or oxide, such as sodium or potassium nitrate, chromate, or peroxide. In the case of the

nitrates, a fertiliser consisting of calcium nitrate and sodium or potassium phosphate is obtained.

351,098. STABILISING GRANULAR SALTS. A Mentzel, 2 Nordsternstrasse, Schöneberg, Berlin. International Convention date, March 26, 1929.

Salts which are easily decomposable, hygroscopic, volatile or otherwise unstable, are subjected to superficial treatment to convert the surface of each granule into a protective coating. Thus ammonium bicarbonate is treated with sodium chloride solution so that the granules are coated with sodium bicarbonate containing a small proportion of ammonium chloride. When fertilisers are treated, the treating substance



351,098

is such that the surface coating is also a fertiliser. The granular substance is fed from a hopper 1 to a disc centrifuge 2 having a cover 4, so that the material is thrown out in a narrow layer which is treated with a fine spray of solution from an annular nozzle 5. The granules pass to a collector 6 and excess solution to a trough 11. Alternatively, the solution may be supplied to the disc 2, and the granular substance to an annular distributor.

Specifications Accepted with date of Application

357,125. Derivatives of polyhydric alcohol-polybasic acid condensation products. Imperial Chemical Industries, Ltd., and W. Baird. May 6, 1930.

357,135. Catalytic manufacture and production of carbon black. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) June 13, 1930.

357,152. Hydroxy aliphatic amines, Manufacture of. H. Dreyfus. June 16, 1930.

357,155. Colour lakes, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie Akt.-Ges.*) April 12, 1930.

357,170. Liquid, particularly aromatic hydrocarbons, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) June 10, 1930.

357,172. Apparatus for continuous extraction and filtration. P. L. Fauth Ges. June 14, 1929.

257,178. Sulphur from sulphur dioxide, Production of. D. Tyrer and Imperial Chemical Industries, Ltd. June 16, 1930.

357,189. Gold compounds of degradation products of keratin, Manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) June 18, 1930.

357,195. Vat dyestuffs, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) April 17, 1930.

357,206. Liquid hydrocarbons from solid fuels, Production of. Physical Chemical Research Co. June 4, 1929.

357,250. Basic products derived from cyclic acids, Manufacture of. I.G. Farbenindustrie Akt.-Ges. June 20, 1930. Addition to 317,325.

357,254. Chromium-nickel-iron-carbon alloys, Treatment of. F. Krupp Akt.-Ges. June 24, 1929.

357,285. Dyes and dye intermediates, Manufacture of. Imperial Chemical Industries, Ltd., P. F. Bangham and R. F. Thomson. July 1, 1930.

357,366. Cobalt or compounds thereof, Recovery of. E. A. A. Gronwall. September 17, 1929.

357,380. Dyestuffs of the anthraquinone series, Preparation of. Chemische Fabrik vorm. Sandoz. October 4, 1929.

357,387. Pickling of metals and the like processes. Imperial Chemical Industries, Ltd. October 9, 1929.

357,396. Ammonium sulphate-nitrate, Production of. Gewerkschaft Victor. October 17, 1929.

357,411. Drying and dehydrating moist high grade neutral calcium hypochlorite. I.G. Farbenindustrie Akt.-Ges. November 15, 1929.

357,428. Protecting magnesium and magnesium alloys from attack by hot baths of saline melts. I.G. Farbenindustrie Akt.-Ges. December 11, 1929.

357,438. Anhydrous hydrofluoric acid, Production of. A. L. Mond. (*I.G. Farbenindustrie Akt.-Ges.*) December 10, 1930.

357,461. Fertilisers, Manufacture of. Imperial Chemical Industries, Ltd. January 17, 1930.

357,473. Fertiliser mixture, Production of. Kali-Forschungs-Anstalt Ges. February 21, 1930.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

(African Explosives & Industries, Ltd.). Apparatus for continuous manufacture of superphosphate fertilizer. 27,446. October 2.

American Air Filter Co., Inc. Separators. 27,434. October 2. (United States, October 2, '30.)

Bloxam, A. G. (Soc. of Chemical Industry in Basle). Manufacture of ammonium salts. 27,353. October 1.

Brackett & Co., Ltd., F. W. Water-softening &c. processes. 27,056. September 29.

—— Apparatus for discharge of measured quantities of substances in pulverulent &c. state. 27,057. September 29.

Bramwell, B. Filtering-apparatus. 27,229. September 30.

Carbo-Norit-Union Verwaltungs Ges. Preventing appearance of sulphurated hydrogen in gases. 26,999. September 28. (Germany, October 4, '30.)

Dorr Co., Ltd., and Gibbs, R. C. Treatment of sewage. 27,071. September 29.

Downs, C. Continuous drying-apparatus. 26,977. September 28.

Dreyfus, H. Manufacture of artificial filaments, &c. 27,076, 27,077. September 29.

—— Treatment of ester materials. 27,078. September 29.

—— Treatment of cellulose ethers. 27,079. September 29.

—— Manufacture of aliphatic acidyl compounds. 27,233. Sept. 30.

—— Treatment of cellulose derivative materials. 27,234. Sept. 30.

—— Manufacture &c. of aliphatic compounds. 27,322. October 1.

—— Manufacture of artificial products. 27,324. October 1.

—— Manufacture of artificial filaments &c. 27,381. October 1.

—— Performing chemical reactions. 27,459. October 2.

—— Organic oxidation reactions, and recovery of products thereof. 27,460. October 2.

Du Pont de Nemours & Co., E. I. Manufacture of alkyl halides. 27,447. October 2. (United States, October 2, '30.)

Gladitz, C., and Rogers, F. H. Recovery of gold from its ores. 27,468. October 2.

Grasselli Chemical Co. Fungicides, insecticides, &c. 27,358. October 1. (United States, October 1, '30.)

Handasyde, E. S. Distillation of carbonaceous materials. 27,548. October 3. (July 5, '30.)

Hene, E. Production of cyanides. 27,027. September 28. (May 22.)

(I.G. Farbenindustrie Akt.-Ges.). Johnson, J. Y. Oxidiation of organic compounds. 26,961. September 28.

——, Johnson, J. Y. Manufacture of wetting &c. agents. 26,962. September 28.

——, Johnson, J. Y. Manufacture of assistants for textile &c. industries. 36,963. September 28.

——, Johnson, J. Y. Production of polyhydric alcohols. 26,964. September 28.

——, Johnson, J. Y. Printing with vat dyestuffs. 27,222. Sept. 30.

——, Johnson, J. Y. Manufacture of vinyl ketones. 27,529. Oct. 3.

——, Johnson, J. Y. Manufacture of catalyst. 27,530. October 3.

——, Johnson, J. Y. Manufacture of viscous oils. 27,531. Oct. 3.

——(Johnson, J. Y. Purification of acetylene. 27,532. October 3.

I.G. Farbenindustrie Akt.-Ges. Manufacture of polymerization products. 27,091. September 29. (Germany, October 2, '30.)

Imperial Chemical Industries, Ltd. Vessels for resisting high pressure. 27,113. September 29.

—— Production of wetting &c. agents. 27,278. September 30.

—— Disazo dyestuffs. 27,279, 27,280. September 30.

Kali-Forschungs-Anstalt Ges. Production of anhydrous neutral calcium nitrate. 27,430. October 2. (Germany, February 24.)

Lonza Elektrizitätswerke und Chemische Fabriken Akt.-Ges. Manufacture of plastic masses from cellulose acetates. 27,230. September 30. (Germany, October 9, '30.)

Meissner, J. Production of alkaline azids. 27,257. September 30. (Germany, November 10, '30.)

Metallges, Akt.-Ges. Production of alkali sulphates and sulphur. 27,032. September 28. (Germany, May 13.)

Naugatuck Chemical Co. Treatment of rubber. 27,109. September 29. (United States, October 24, '30.)

—— Process of making fibre products. (27,120. September 29. (United States, November 3, '30.)

Schering-Kahlbaum Akt.-Ges. Manufacture of cyclic ketones. 27,001. September 28. (Germany, October 17, '30.)

Vereinigte Stahlwerke Akt.-Ges. Process for cracking hydrocarbons. 27,160. September 29. (Germany, October 23, '30.)

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£17 15s. per ton d/d address U.K. in casks.

ACID CHROMIC.—11d. per lb., less 2½% d/d U.K.

ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.

ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 108° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.

AMMONIUM BICHROMATE.—8½d. per lb., d/d U.K.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER, 35/37%.—Spot, £7 10s. per ton d/d station in casks, special terms for contracts.

BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)

CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.

CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.

CHROMETAN.—Crystals, 3¼d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. net d/d U.K., discount according to quantity; ground ½d. per lb. extra.

POTASSIUM CHLORATE.—3¾d. per lb. ex-wharf, London, in cwt. kegs.

POTASSIUM CHROMATE.—8½d. per lb. d/d U.K.

SALAMMONIAC.—First lmp, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.

SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.

SODA CAUSTIC, SOLID, 76/77° E.—Spot, £14 10s. per ton, d/d station.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.

SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER).—3½d. per lb. net d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.

SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.

SODIUM CHLORATE.—2¾d. per lb.

SODIUM CHROMATE.—3¾d. per lb. d/d U.K.

SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.

SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.

SODIUM SILICATE., 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.

SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.

SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in drums. Crystals—Spot, £8 5s. per ton, d/d in casks.

SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton; d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4⅞d. to 6¼d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.

ACID CRESYLIC 99/100.—1s. 8d. to 1s. 9d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 1s. 11d. to 2s. 2d. per gall. Pale, 98%, 1s. 7d. to 1s. 8d. Dark, 1s. 4d. to 1s. 4½d.

ANTHRACENE OIL, STRAINED (GREEN OIL).—4½d. to 4¾d. per gall.

BENZOLE.—Prices at works: Crude, 7d. to 7½d. per gall.; Standard Motor, 1s. 2d. to 1s. 3d. per gall. 90%.—1s. 3d. to 1s. 4d. per gall. Pure, 1s. 6d. to 1s. 7d. per gall.

TOLUOLE.—90%, 1s. 9d. to 1s. 10d. per gall. Pure, 1s. 11d. to 2s. per gall.

XYLOL.—1s. 8d. to 1s. 9d. per gall. Pure, 1s. 11d. to 2s. per gall.

CREOSOTE.—Standard specification, for export, 4¾d. to 5d. net per gall. f.o.b.; for Home, 3¾d. per gall. d/d.

NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 5d. to 1s. 6d. per gall. Solvent, 90/190, 1s. to 1s. 5d per gall.

NAPHTHALENE.—Purified Crystals, £10 per ton, in bags.

PITCH.—Medium soft, 55s. per ton, in bulk at makers' works.

PYRIDINE.—90/140, 3s. to 3s. 3d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID GAMMA.—Spot, 3s. 3d. per lb. 100% d/d buyer's works.

ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.

ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.

ACID SULPHANILIC.—Spot, 8¼d. per lb. 100% d/d buyer's works.

ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.

ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.

BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.

BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.

o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.

m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.

p-CRESOL 34.5° C.—1s. 9d. per lb., in ton lots.

DICHLORANILINE.—2s. 5d. per lb.

DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.

DINITROBENZENE.—7½d. per lb.

DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.

DIPHENYLAMINE.—Spot, 1s. 8d. per lb., d/d buyer's works.

a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.

B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.

a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.

B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.

o-NITRANILINE.—5s. 11d. per lb.

m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.

p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.

NITROBENZENE.—Spot, 6½d. per lb.; 5-cwt. lots, drums extra, d/d buyers' works.

NITRONAPHTHALENE.—8½d. per lb.

SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.

o-TOLUIDINE.—Spot, 9½d. per lb., drums extra, d/d buyer's works.

p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.

m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £6 10s. per ton. Grey, £11 to £13 per ton. Liquor, 7d. to 9d. per gall.

ACETIC ACID, TECHNICAL, 40%.—£15 15s. per ton.

ACETONE.—£63 to £65 per ton.

AMYL ACETATE, TECHNICAL.—85s. to 95s. per cwt.

CHARCOAL.—£6 10s. per ton, according to grade and locality.

IRON LIQUOR.—24°/30° Tw., 9d. to 1s. 2d. per gall.

METHYL ACETONE, 40/50%.—£43 per ton.

RED LIQUOR.—16° Tw., 7½d. to 9d. per gall.

WOOD CREOSOTE.—9d. to 1s. 6d. per gall., unrefined.

WOOD NAPHTHA, MISCIBLE.—1s. per gall. Solvent, 3s. 6d. to 4s. per gall.

WOOD TAR.—£1 10s. per ton.

BROWN SUGAR OF LEAD.—£30 to £32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 5d. to 1s. 7d. per lb.

BARYTES.—£6 to £7 10s. per ton, according to quality.

CADMIUM SULPHIDE.—3s. 3d. to 3s. 6d. per lb.

CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.

CARBON, BLACK.—3d. to 4d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—2s. 6d. per lb.

INDIARUBBER SUBSTITUTES, WHITE.—4d. to 5½d. per lb.; Dark, 4d. to 4½d. per lb.

LAMP BLACK.—£27 per ton.

LITHOPONE, 30%.—£18 to £20 per ton.

SULPHUR.—£9 10s. to £13 per ton.

SULPHUR CHLORIDE.—4d. to 7d. per lb., according to quality.

SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.

SULPHUR PRECIP. COMMERCIAL.—£40 to £45 per ton.

VERMILION, PALE OR DEEP.—6s. 2d. to 6s. 8d. per lb.

ZINC SULPHUR.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4d. to 1s. 6d. per lb.

ACID, ACETIC, PURE, 80%.—£35 5s. per ton d/d address U.K. in casks.

ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.

ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.

ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

ACID, CAMPHORIC.—19s. to 21s. per lb.

ACID, CITRIC.— 1s. 0½d. per lb., less 5%.

ACID, GALLIC.—2s. 9d. per lb., for pure crystal, in cwt. lots.

ACID, MOLYBDIC.—6d. 3d. per lb. in ½-cwt. lots. Packages extra. Special prices for quantities and contracts.

ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots; Resublimed, 8s. 6d. per lb. for 28-lb. lots, d/d.

ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.

ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.

ACID, TARTARIC.—1s. 0½d. per lb., less 5%.

AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.

AMMONIUM BENZOATE.—3s. 6d. per lb.

AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.

AMMONIUM MOLYBDATE.—6s. 3d. per lb. in ½ cwt. lots. Packages extra. Special prices for quantities and contracts.

ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.

BARBITONE.—5s. 9d. to 6s. per lb.

BENZONAPHTHOL.—2s. 10d. per lb.

BISMUTH CARBONATE.—7s. 9d. per lb.

BISMUTH CITRATE.—9s. 2d. per lb.

BISMUTH SALICYLATE.—7s. 9d. per lb.

BISMUTH SUBNITRATE.—6s. 6d. per lb.

BISMU H NITRATE.—Cryst. 5s. 1d. per lb.

BISMUTH OXIDE.—11s. 1d. per lb.

BISMUTH SUBCHLORIDE.—10s. 9d. per lb.

BISMUTH SUBGALLATE.—7s. 4d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth sales respectively.

BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W.Qts. 1s. 2d. per lb.; 6 W. Qts. 11½d. per lb.; 12 W. Qts. 10d. per lb.; 36 W. Qts. 9½d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2d. per lb.; 6 W. Qts., 11½d. per lb.; 12 W. Qts. 10d. per lb.; 36 W. Qts., 9½d. per lb.

BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.

BROMIDES, B.P.—Ammonium, 1s. 7d. per lb.; potassium, 1s. 4d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s 6d. per lb. Prices for 1-cwt. lots.

CAFFEIN, PURE.—6s. 6d. per lb.

CAFFEIN CITRAS.—5s. per lb.

CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.

CAMPHOR.—Refined flowers, 2s. 11d. to 3s. 1d. per lb., according to quantity; also special contract prices.

CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.

CHLOROFORM.—2s. 4d. per lb.

ETHERS.—S.G. .730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.

FORMALDEHYDE, 40%.—30s. per cwt. in barrels, ex wharf.

GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.

HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.

HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.

HYDROQUINONE.—4s. 7d. per lb. in 1-lb. lots; 3s. 5¾d. per lb. in cwt. lots.

HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.

IRON AMMONIUM CITRATE.—B.P., 1s. 9d. per lb. for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 7d. per lb. list price.

IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.

IRON QUININE CITRATE.—B.P., 8¼d. to 8¾d. per oz.

MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.

MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.

MENTHOL.—A.B.R. recrystallised B.P., 13s. 6d. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 9s. 9d. per lb., according to quantity; Liquid (95%), 8s. per lb.

MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 9s. 4d. to 9s. 5d. per lb., levig., 8s. 10d. to 8s. 11d. per lb.; Corrosive Sublimate, Lump, 7s. 5d. to 7s. 6d. per lb., Powder, 6s. 8d. to 6s. 9d. per lb.; White Precipitate, Lump, 7s. 5d. to 7s. 6d. per lb.; Powder, 7s. 6d. to 7s. 7d. per lb.; Calomel, 8s. to 8s. 1d. per lb.; Yellow Oxide, 8s. 7d. to 8s. 8d. per lb.; Persulph, B.P.C., 7s. 9d. to 7s. 10d. per lb.; Sulph. nig., 8s. 2d. to 8s. 3d. per lb. Special prices for larger quantities.

METHYL SALICYLATE.—1s. 3d. to 1s. 4d. per lb.

PARAFORMALDEHYDE.—1s. 6d. per lb.

PARALDEHYDE.—1s. 1d. per lb.

PHENACETIN.—3s. 9d. to 4s. 1d. per lb.

PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.

POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—90s. per cwt., less 2½ per cent.

POTASSIUM CITRATE.—B.P., 1s. 7d. per lb. for 28-lb. lots.

POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.

POTASSIUM IODIDE.—B.P., 21s. 4d. to 24s. 4d. per lb., as to quantity.

POTASSIUM METABISULPHITE.—50s. per cwt. d/d London, kegs free.

POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.

QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.

SACCHARIN.—43s. 6d. per lb.

SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.

SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.

SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.

SODIUM BENZOATE B.P.—1s. 6d. to 1s. 7½d. per lb.

SODIUM CITRATE.—B.P.C. 1911, 1s. 4d. per lb. B.P.C. 1923, and U.S.P., 1s. 8d. per lb., for 28-lb. lots.

SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.

SODIUM NITROPRUSSIDE.—16s. per lb.

SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—73s. per cwt. net. Crystals, 2s. 6d. per cwt. extra.

SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.

SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.

SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton, according to quantity. Delivered U.K.

STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.

TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.

THYMOL.—Puriss, 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.

ZINC STEARATE.—1s. 4d. to 1s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.

AUBEPINE (EX ANETHOL).—8s. 9d. per lb.

AMYL ACETATE.—2s. 3d. per lb.

AMYL BUTYRATE.—4s. 9d. per lb.

AMYL CINNAMIC ALDEHYDE.—8s. 6d. per lb.

AMYL SALICYLATE.—2s. 6d. per lb.

ANETHOL (M.P. 21/22° C.).—5s. per lb.

BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.

BENZYL ACETATE FROM CHLORINE-FREE ALCOHOL.—1s. 9d. per lb.

BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.

BENZYL BENZOATE.—2s. 2d. per lb.

CINNAMIC ALDEHYDE NATURAL.—10s. 6d. per lb.

COUMARIN.—12s. per lb.

CITRONELLOL.—7s. 3d. per lb.

CITRAL.—6s. per lb.

ETHYL CINNAMATE.—6s. 9d. per lb.

ETHYL PHTHALATE.—2s. 6d. per lb.

EUGENOL.—7s. 6d. per lb.

GERANIOL.—6s. to 10s. per lb.

GERANIOL (FROM PALMAROSA).—14s. per lb.

HELIOTROPINE.—5s. 6d. per lb.

ISO EUGENOL.—9s. per lb.

LINALOL (EX BOIS DE ROSE).—5s. 6d. per lb.

LINALYL ACETATE, EX BOIS DE ROSE.—7s. 6d. per lb. Ex Shui Oil, 7s. 6d. per lb.

METHYL ANTHRANILATE.—6s. per lb.

METHYL BENZOATE.—4s. 3d. per lb.

MUSE XYLOL.—6s. 6d. per lb.

PHENYL ETHYL ACETATE.—10s. per lb.

PHENYL ETHYL ALCOHOL.—8s. 3d. per lb.

RHODINOL.—40s. per lb.

SAFROL.—1s. 6d. per lb.

VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s. 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 4d. per lb.

BERGAMOT OIL.—7s. 9d. per lb.

BOURBON GERANIUM OIL.—17s. per lb.

CAMPHOR OIL.—White, 75s. per cwt.; Brown, 75s. per cwt.

CANANGA.—Java, 7s. per lb.

CINNAMON OIL LEAF.—4s. per oz.

CITRONELLA OIL.—Java, 2s. 6d. per lb., c.i.f. Pure Ceylon, 2s. per lb.

CLOVE OIL, 90/92%.—6s. per lb.

EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%.—1s. 4d. per lb.

LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb.

LEMON OIL.—4s. 3d. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.*

London, October 7, 1931.

MARKETS continue disorganised with prices in many cases nominal. There is a considerably increased demand in all directions, with stocks in many instances almost depleted.

General Chemicals

ACETONE.—Is firm at £62 per ton and in regular daily demand.

ACID, ACETIC.—Is unchanged at £35 5s. to £37 5s. per ton for Pure 80%, with Technical 80% £1. per ton less.

ACID, CITRIC.—Firm at 1s. 2d. per lb., less 5%

ACID, FORMIC.—Is in good demand with a very firm position.

ACID, OXALIC.—£42 to £43 per ton in casks.

ALUMINA SULPHATE.—The market continues purely nominal.

CREAM OF TARTAR.—94s. to 96s. per cwt., less 2½%.

FORMALDEHYDE.—Very firm at £27 28 per ton.

LEAD ACETATE.—Nominal.

LITHOPONE.—Firm at about £22 per ton.

BICHROMATE OF POTASH.—4½d. per lb.

PERMANGANATE OF POTASH.—Very firm at 6d. to 6½d. per lb.

SODIUM BICHROMATE.—In good request and unchanged at 3½d. per lb.

TARTAR EMETIC.—Firm at about 11½d. per lb.

Coal Tar Products

THE prices of Coal Tar Products are unchanged from last week, although there is still a strong tendency for prices to rise. Owing, however, to the lack of business, it is difficult to quote any changed prices.

MOTOR BENZOL.—Remains at about 1s. 4½d. to 1s. 5½d. per gallon f.o.r.

SOLVENT NAPHTHA.—Quoted at about 1s. 1½d. to 1s. 2d. per gallon f.o.r.

HEAVY NAPHTHA.—Unchanged at about 11d. to 1s. 0½d. per gallon f.o.r.

CREOSOTE OIL.—Remains at about 3d. to 3½d. per gallon f.o.r. in the North, and at about 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Quoted at about 1s. 6d. per gallon f.o.r. for the 98/100% quality, and at about 1s. 4d. per gallon for the Dark quality 95/97%.

NAPHTHALENES.—Unchanged at about £2 5s. to £2 10s. per ton for the firelighter quality, at about £2 15s. to £3 per ton for the 74/78 quality, and at about £4 per ton for the 76/78 quality.

PITCH.—The export price remains at 55s. to 57s. 6d. per ton, f.o.b. East Coast port, to which price it rose owing to the depreciation in sterling.

Latest Oil Prices

LONDON, October 7.—LINSEED OIL was easy for near. Spot, ex mill, £19; October, £15 2s. 6d.; October-December, £15 5s.; January-April, £17; May-August, £17 15s., naked. RAPE OIL was slow. Crude, extracted, £29 10s.; technical refined, £31 10s., naked, ex wharf. COTTON OIL was steady. Egyptian crude, £22; refined common edible, £26; and deodorised, £28. TURPENTINE was quiet. American spot, 52s. 6d. per cwt.

HULL.—LINSEED OIL.—Spot and October closed at £16, October-December at £16 5s., January-April at £16 17s. 6d., and May-August at £17 15s. naked. COTTON OIL, Bombay, crude, spot, unquoted. Egyptian, crude, spot, £23; edible, refined, spot, and technical, spot, £26; deodorised, £28, naked. PALM KERNEL OIL, crude, naked, f.m.q., spot, £22 10s. GROUNDNUT OIL, crushed/extracted, spot, £28; deodorised, £32. SOYA OIL, crushed extracted, spot, £19; deodorised, £22 10s. RAPE OIL, crushed/extracted, spot, £28 10s.; refined, £30 10s. per ton. COD OIL, 17s. per cwt. CASTOR OIL, pharmacy, spot, 45s. 6d.; firsts, 40s. 6d.; seconds, 38s. 6d. per cwt. TURPENTINE not quoted.

Fertiliser Market

SULPHATE OF AMMONIA.—*Export.*—During the week the market has remained firm at about £5 15s. per ton f.o.b. U.K. port in single bags. *Home.*—It is understood that merchants are covering their requirements at the present price of £6 5s. per ton. On account of the low prices which have been in operation it is anticipated that the consumption of sulphate of ammonia will show a large increase.

NITRATE OF SODA.—Prices in the U.K. have been withdrawn and apparently no business is being transacted in this product. It is observed that in the United States a price of 36 dollars per 2,000 lb. has been announced against a price of 41 dollars for last season; this price is considerably above the price of sulphate of ammonia in this market.

Scottish Coal Tar Products

SUPPLIES are becoming quite scarce in this district principally on account of the increased export demand during the last few weeks. Tar Acids are beginning to command more attention although no alteration in values has taken place.

Cresylic Acid.—More interest is being shown in all grades. Pale, 99/100 per cent., 1s. 5d. to 1s. 6d. per gallon; pale, 97/99 per cent., 1s. 3d. to 1s. 4d. per gallon; dark, 97/99 per cent., 1s. 2d. to 1s. 3d. per gallon; all f.o.r. naked. High Boiling is firmer at 2s. 9d. to 3s. 3d. per gallon.

Carbolic Sixties.—Some sales are reported at the equivalent of 1s. 5d. to 1s. 6d. per gallon according to quality.

Creosote Oil.—Market is steady with prompt supplies not too plentiful. Specification oils, 2½d. to 3d. per gallon; washed oil, 3¼d. to 3½d. per gallon; gas works ordinary, 3½d. to 3¾d. per gallon; all f.o.r. works in bulk.

Coal Tar Pitch.—To-day's export value may be taken at 47s. 6d. to 50s. per ton f.o.b. Glasgow, but supplies are scarce and distillers are unwilling to offer in any great quantity. Home trade is quiet, but price is higher at 45s. per ton ex works.

Blast Furnace Pitch.—In moderate call at controlled prices, viz., 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Distillers are not offering further quantities for prompt and therefore value is nominal at 2⅝d. to 2¾d. per gallon ex works in buyers' packages.

Blast Furnace Tar is steady at 2⅜d. per gallon f.o.r.

Crude Naphtha.—Supplies are not plentiful and value remains at 4¼d. to 5¼d. per gallon.

Water White Products.—Conditions remain dull. Motor benzole, 1s. 3½d. to 1s. 4½d. per gallon; 90/160 solvent, 1s. 2½d. to 1s. 3½d. per gallon; and 90/160 heavy solvent, 1s. 0½d. to 1s. 1½d. per gallon; all f.o.r. in bulk.

South Wales By-Products

THERE is very little change in South Wales by-product activities, uncertainty being a feature of most business done. The most interesting news of the week from the Welsh standpoint was the Imperial Chemistries announcement that petrol from coal on a commercial basis is now a reality. This, of course, will mean a great deal to South Wales and Monmouthshire inasmuch as the best coal for petrol extraction is mined in these two fields. Further statements on the matter are being eagerly awaited in South Wales. A stronger pitch call has not yet materialised but, with a strong expectation that a stronger call will eventually materialise, there is a slight increase in demand and values are firmer. Road tar has a fair, steady call. Naphthas are quiet, there being only small calls for solvent and heavy. Refined tars are also quiet, with values for coke oven and gasworks tar unchanged. Patent fuel exports are slightly better. Patent fuel prices, for export, are: 19s. to 19s. 6d., ex-ship Cardiff; 18s. to 18s. 6d., ex-ship Swansea. Coke prices are: Best foundry, 32s. 6d. to 36s. 6d.; good foundry, 22s. 6d. to 25s.; furnace, 15s. 6d. to 16s.

New Benn Books

FORTHCOMING books announced by Ernest Benn, Ltd., include the following:—

GREAT AMERICAN SHORT STORIES, edited by Stephen Graham, 8/6. The latest and best additions to the well-known series, which already includes great French, German, Russian and Italian short stories.

VICTORIAN BOUQUET, edited by Rachel Ferguson, 6/-. The author of the very successful "The Brontes Went to Woolworth's" now edits these very amusing and instructive memoirs of a Victorian.

DUSTY DEATH, by Clifton Robbins, 7/6. A first detective story of merit. This, Clay Harrison's first case, has just been serialised with great success in the London *Evening News.*

THE USE OF FERTILISERS IN TROPICAL AND SUB-TROPICAL AGRICULTURE, by A. Jacob and V. Coyle, 10/6. Science has introduced fertilisers for the Tropics and this is the first book on the subject.

THE CASE OF BENN V. MAXTON, by James Maxton, M.P., and Ernest J. P. Benn, 2/6. First Cheap Edition.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Chas. Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.*

Glasgow, October 8, 1931.

THE exchange rate is having a quietening effect on the Scottish heavy chemical market. Enquiries are slow and generally for immediate requirements.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £45 to £56 per ton; pure, £35 5s. per ton; technical, 80%, £34 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £25 per ton; crystals, £26 per ton; B.P. crystals, £34 per ton; B.P. powder, £35 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at £34 10s. per ton, ex store.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality. £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 11d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 10s. per ton, c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station.

ANTIMONY OXIDE.—Spot material obtainable at round about £34 per ton, ex wharf.

ARSENIC, WHITE POWDERED.—Quoted £23 10s. per ton, ex wharf. Spot material still on offer at £24 per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £10 15s. per ton, c.i.f. U.K. ports.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £20 per ton, ex store.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station.

LEAD, RED.—Price now £30 per ton, delivered buyer's works.

LEAD, WHITE.—Quoted £38 per ton, carriage paid.

LEAD ACETATE.—White crystals quoted round about £42 to £44 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 10s. per ton, ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p., quoted 2s. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4¼d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £23 10s. per ton ex store.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £26 15s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5¼d. per lb. ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb., ex store.

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77%, £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-toun lots; for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3¾d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Price not yet fixed.

SODIUM PRUSSIATE.—Quoted 5¼d. per lb., ex store. On offer at 5d. per lb., ex wharf to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 60s. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyer's works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Institution of Chemical Engineers

OWING to the illness and subsequent death of Professor J. W. Hinchley, Mr. H. W. Cremer has since the end of July acted as Honorary Secretary of the Institution. The President's Reception is to be held on Thursday, November 26, at the New Princes' Galleries, London. The Autumn Public Lecture, to be delivered in the lecture theatre of the Institution of Civil Engineers on Friday, October 30, will be by Dr. E. F. Armstrong, whose subject will be "Hydrogenation." The conference on "Testing" which had been proposed for December has been postponed. The opening meeting of the Graduates and Students Section will be held on Wednesday, October 28, when Mr. C. A. R. Stead (Graduate) will present a paper on "Crushing and Grinding with Special Reference to Ball Mills." Recent elections to to the Institution include: Members—Viscount Leverhulme (Lever Brothers, Ltd.); Mr. C. E. Spearing (Anglo-Persian Oil Co., Ltd.); Student—Mr. E. H. Mailer, University of the Witwatersrand, South Africa.

Chemical Engineering at King's College

THE normal teaching course in chemical engineering at King's College covers one session, and is designed so that it may be taken in the year following the Final B.Sc. Examination by students, registered in the Faculties of Science or Engineering. Its object is to train the student in the scientific principles underlying the methods of carrying out chemical processes on the technical scale by teaching him to apply the principles of physics, physical chemistry and engineering to the general methods and apparatus employed in industry. For this purpose the course, which is organised by Mr. H. W. Cremer, F.I.C., M.I.Chem.E., is designed on the basis of close co-operation between the departments of chemistry and engineering. Thus, chemistry students receive under conditions similar to those met with in practice the necessary training in such subjects as engineering drawing, commercial testing of materials of construction, production and transmission of mechanical and electrical energy, and the determination of the efficiencies of boiler installations and of the more general types of mechanical and electrical plant, whilst engineering students devote an equivalent amount of time to further instruction in suitable branches of chemistry. Fundamental operations common to a large number of chemical industries are studied and investigated from the point of view of plant construction, energy requirements, and efficiency of operation. Examples are given in the design of typical units of plant, and instruction is provided in the preparation of quantitative flow-sheets both for materials and energy, in the calculation of costs, and in the general principles underlying the location and layout of works.

Manchester Chemical Market

[From Our Own Correspondent.]

Manchester, October 8, 1931.

Most of the principal lines of chemical products, but especially the imported varieties, have come in for greater attention during the past two or three weeks and actual business has been much more active than at any other time this year. The difficulties of trading in consequence of the fluctuations in the exchange value of the pound has been very serious, although sellers seem to have been less troubled by them than they were in the two previous weeks, and some of them report fairly extensive sales over varying periods of delivery. The tendency of prices is distinctly firm, and in a number of instances, following on the advances already reported, further rises have occurred since a week ago.

Heavy Chemicals

A quiet to moderate business is going through in the case of saltcake, and prices are steady in the neighbourhood of £2 15s. per ton. The demand for bicarbonate of soda is on fairly satisfactory lines and here also values are maintained at about £10 10s. per ton. Caustic soda meets with a steady flow of delivery specifications against existing commitments, contract values ranging from £12 15s. to £14 per ton, according to grade. A moderate business has been put through in chlorate of soda, which is much firmer at about £30 per ton. Offers of bichromate of soda are more or less nominal at the moment at 3½d. per lb. There is some inquiry about the phosphate of soda, with the dibasic material appreciably dearer on balance at round £12 10s. per ton. Up to the present there has been little actual change in the price position of sulphide of sodium, although the tendency is distinctly firm; current offers of the commercial quality are at round £7 15s. per ton, and of the 60-65 per cent. concentrated solid grade at about £9 per ton. Hyposulphate of soda is steady and a moderate amount of buying interest is being displayed; the commercial material is quoted at up to £15 10s. per ton, and the commercial at £9 5s. Alkali is in fair demand and values are firm at about £6 per ton. Prussiate of soda is more or less nominal at the moment at 4¾ to 5¼ per lb. according to quantity.

In the potash section, the story continues to be one of steadily advancing quotations. Permanganate has moved up to from 6d. to 6¼d. per lb. for the commercial description, and to 6¾d. for the B.P. grade, although there seems to have been only a relatively quiet business put through. Chlorate of potash is likewise very firm at from £32 to £33 per ton, and yellow prussiate at about £66 per ton, with inquiry in both instances on moderate lines. For solid cautic potash, the general quotation is now about £37 per ton, with carbonate in fair request at up to £28 10s. per ton. Bichromate of potash is now being quoted at round 5½d. per lb., with current sales of moderate volume.

Sulphate of copper is steadier than it has been at from £18 10s. to £19 per ton, f.o.b., but the demand is not very extensive. White powdered (Cornish) arsenic continues in relatively short supply and high prices have been mentioned in connection with this material during the past week, the average being about £26 per ton at the mines. The lead products are in quiet demand, with the white and brown acetates at £33 10s. and £32 10s. per ton, and nitrate at round £29. Inquiry for the acetates of lime is moderate and there has been little change in values, the grey quality being quoted at about £12 per ton and the brown at £7 5s.

Acids for Tar Products

Tartaric acid meets with a moderate demand at the higher level of 11⅜d. per lb. Citric acid is appreciably dearer and round 1s. 1½d. per lb. is about current value. Acetate acid is firmer at about £38 per ton for the commercial 80 per cent. quality, with the technical glacial material offering £51. With regard to oxalic acid, this has firmed up to from £2 to £2 2s. per cwt., ex store, and moderate sales have been reported during the past week.

In the by-products market, pitch continues to attract a fair amount of attention and values are firm at from 53s. 6d. to 55s. per ton, f.o.b. Not a great deal of business is being done in creosote oil, which is quoted to-day at from 3½d. to 4¼d. per gallon, naked, at works.

Company News

Imperial Chemical Industries, Ltd.—An interim dividend of 1½ per cent., less tax at 5s. in the £, has been declared on the £43,589,538 ordinary share capital in respect of the year ending December 31 next, payable on December 1. Last year the interim on the ordinary was 3 per cent., less tax at 4s. 6d. in the £.

Cheshire United Salt.—The accounts for the year ended June 30, 1931, show a net profit of £1,131 after making full allowances for depreciation and income tax. Secured Notes to the value of £200 have been redeemed and mortgaged on freehold works reduced by £1,000.

Blundell Spence & Co.—The directors announce that the results of the first six months of this year's trading showed improvement, but they have decided that it will be prudent to delay payment of final instalment of dividend on the preferred shares (normally paid on the last Tuesday in October of each year) until the audited accounts for the year ending October 31, 1931, show whether such payment would be justified.

United Molasses, Ltd.—In an interim statement the directors state that the accounts for the six months to June 30 last show a trading profit of £160,000, which compares with one of £812,000 for the twelve months to December 31. Depreciation calculated at the same rate as last year would amount to £150,000 for the six months, leaving a balance of £10,000. It is stated, however, that losses of £115,000 have been incurred through the necessity of wasting molasses for which no market could be found, and other losses of £80,000 have been incurred in the subsidiary companies. There is thus a net deficiency on the company's operations for the half-year of £185,000. The trading results for the second half-year are not expected to differ greatly from those of the first half, but as a very large proportion of the eastern crops, which are produced during the second half of the year, will have to be wasted the allowance under this head will be considerably greater. It is to be inferred that the deficit on the year will exceed £350,000 at least. Last year the final debit to profit and loss account was £913,434, and a deficit of £64,260 was carried forward after absorbing the entire capital and general reserves. The directors estimate that the company's cash and loan position at the end of the year will not be materially different from that at December 3 last, when there were bank loans outstanding of £623,250. They state that the depreciation in the value of sterling should not have much influence on the company's business during the remainder of the year, as the payments due to the company in gold currencies approximately balance the payments due from it.

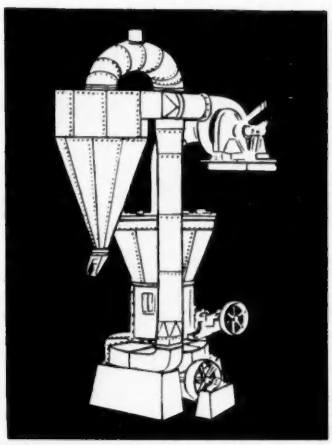
Babcock and Wilcox, Ltd.—An interim dividend on the ordinary shares of 7 per cent., less tax, is announced.

Glenboig Union Fire Clay Co.—The report for the year to August 31, 1931, states the balance at the credit of profit and loss acount, after transferring £6,000 from reserve amounts to £140 (against £6,142, including amount brought forward and £5,000 from reserve), which the directors recommend should be carried forward. The ordinary capital expenditure during the year was £1,920. A sum of £6,181 has been expended on repairs and renewals for the year, and has been paid out of revenue.

Chemical Bank and Trust Co., of New York.—A statement of the condition at September 30, 1931, shows assets totalling $443,199,954, comprising cash and due from banks $86,658,404, U.S. bonds and certificates $78,228,844, bankers' acceptances and demand loans $47,703,809, short term notes $19,914,606, State bonds $7,178,098, municipal bonds $14,330,097, other bonds and investments $4,414,425, loans and discounts $140,080,203, banking houses $1,549,169, customers' liability on acceptances $39,722,846, other assets $3,419,449. On the liabilities side appears capital stock $21,000,000, surplus $40,000,000, undivided profits $4,799,518, reserve dividend, taxes, interest, etc., $2,303,080, acceptances outstanding $40,686,143, acceptances of other banks sold with endorsement $4,697,044, other liabilities $546,169, deposits $329,167,997, total $445,199,954.

RAYMOND

PULVERISING AND SEPARATING EQUIPMENT



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New Companies Registered

HART AND PARTINGTON, LTD.—Registered October 5. Nominal capital £10,000 in £1 shares. To acquire the business of manufacturing chemists and drysalters formerly carried on by J. Hart (now deceased) and W. Partington, at Cardigan Works, Ratcliffe, Lancs, and to adopt an agreement with Alice Hart and the said W. Partington. Directors: Mrs. A. Hart; W. Partington, Arden House, Whitefield, near Manchester.

H. K. ROSS, LTD.—Registered October 5. Nominal capital £200 in £1 shares. Pharmaceutical, consulting, analytical, manufacturing, wholesale and retail chemists, etc. Director: H. K. Ross, Northwood, The Glen, Grayshott; J. W. Thomson and C. C. Evans.

NESFIELD RETORTS, LTD., 15 Eldon Street, London, E.C.2.—Registered September 30. Nominal capital, £1,000 in 1s. shares. To acquire from Sensible Heat Distillation, Ltd., and A. Nesfield, the benefit of certain existing inventions relating to improvements in retorts for the drying and/or distillation of bituminous and other materials, and also improvements relating to the distillation of solid carbonaceous materials; to acquire any interest in inventions relating to the carbonisation or distillation of bitumen, coal, shale, slack, peat and other minerals, and to carry on the business of research chemists, chemical manufacturers, general and mining engineers, etc.

STEWART McINTOSH, LTD., Mansion House Chambers, Quayside, Newcastle-on-Tyne.—Registered September 28. Nominal capital £500 in £1 shares. To carry on the business of manufacturers and merchants of and agents for special protective paints, quick-drying anti-corrosive enamels, paints, colours, varnishes, enamels, anti-fouling compositions, etc.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52 Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Marks can be lodged up to October 30, 1931.

NITROLYTE.

525,136. Class 1.—Chemical substances for use in electrical batteries. Nitrolyte, Ltd., Polebrook House, Golden Square, London, W.1; manufacturers.—August 20, 1931.

CIBASOL.

525,289. Class 1.—Aniline dyestuffs. Society of Chemical Industry in Basle (a Joint Stock Company organised under the laws of Switzerland), 141 to 227 Klybeckstrasse, Basle, Switzerland; manufacturers and merchants.—August 26, 1931.

525,290. Class 4.—Aniline dyestuffs. Society of Chemical Industry in Basle (a Joint Stock Company organised under the laws of Switzerland), 141 to 227 Klybeckstrasse, Basle, Switzerland; manufacturers and merchants.—August 26, 1931.

SOFEAU.

525,470. Class 1.—Chemical preparations for softening water. Autolex, Ltd., 77 Grosvenor Road, Westminster, London, S.W.1; manufacturers.—September 4, 1931.

Opposition to the Registration of the following Trade Marks can be lodged up to November 7, 1931.

LISSAMOL.

524,598. Class 1.—Chemical substances used in manufactures, photography, or philosophical research, and anti-corrosives, but not including size and not including any goods of a like kind to size. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester; manufacturers.—July 25, 1931.

Chemical Trade Enquiries

These inquires, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country) except where otherwise stated.

SOUTH AFRICA.—The City of Johannesburg is calling for tenders, to be presented in Johannesburg by October 31, for the supply of pumping plant for the Burma Disposal Works. (Ref. G.X. 10,804.)

NORWAY.—The Cold Storage Warehouse, Ltd., Bergen, is calling for tenders, to be presented in Bergen by October 26, for the supply of ice-making and refrigerating plant. (Ref. A.X. 11,123.)

SWITZERLAND.—A firm of wholesale dealers in Basle are desirous of securing the representation of United Kingdom handling chemical and pharmaceutical products.

Tariff Changes

TUNIS.—The *Journal Officiel Tunisien* of August 15 contains a Decree, dated June 25, to come inti force six months after publication, which lays down regulations for the control of the trade in fertilisers in Tunis. Wrappings, sacks or receptacles containing fertilisers are to bear a label showing the denomination of the fertiliser, its natural or industrial derivation, its strength in fertilising elements, and the nature or state of combination of these, and the same particulars are required to be given in invoices, price lists and various other documents.

MOROCCO.—A Decree, dated June 10, effective six months after publication, provides that the wrappings and receptacles in which insecticides and fungicides are to be delivered to the buyer in the French Zone of Morocco must show clearly the exact name and composition of the products, indicating the active elements contained and the percentage thereof, together with all particulars necessary to identify the products. Subsidiary Orders have been issued to define the particulars required to be shown in the case of sulphur—the degree of fineness and state (raw sulphur, flour of sulphur, triturated sulphur, etc) and strength in pure sulphur; copper salts, other cupric compounds and preparations with a base of copper—the strength in copper, plus, for cupric compounds intended to be used in a powdered state, the degree of fineness of the powder; and arsenical products or preparations.

Chemical Matters in Parliament

Shale-oil Industry

IN the House of Commons on Thursday, October 1, Mr. Shinwell asked the President of the Board of Trade whether he had yet considered the quota proposal for the shale-oil industry; and with what result?

Sir P. Cunliffe-Lister: I understand that when the late Government had before them proposals including that for a quota scheme, Scottish Oils, Ltd., informed the Government that if the mines, retort works and refineries of which notice of closing had been given, were shut down, it would need very heavy capital expenditure to re-open them. That curtailment has been effected, and I am advised that the introduction of the suggested quota scheme would not result in re-opening the closed mines and works. I am also informed that with the present duty on, and prices of, petrol, there is no immediate prospect of further curtailment.

Mr. Shinwell: Is the right hon. gentleman aware that the imposition of the further tax on petrol will not result in the re-opening of the mines?

Sir P. Cunliffe-Lister: That is exactly what I said. I also said that I have an assurance of the company that the tax which the Chancellor of the Exchequer has imposed will enable the existing mines and works to be kept open.